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ABSTRACT

This module is the seventh in an inservice education series for extension professionals that consists of seven independent training modules. It provides information and exercises on working with extension's publics to achieve a proactive stance toward the future through projecting future conditions, analyzing trends, and inventing futures. The module's six units cover techniques for futures perspectives, anticipatory learning, projection and forecasting, prevention and adaptation, invention and creation, and selecting techniques for futures perspectives. The 12-hour module consists of four major parts. The sourcebook includes a concise, readable synopsis of the content, objectives, a selected annotated bibliography (47 items), and a list of 99 references. The leader's guide provides step-by-step instructions on how to conduct the workshop and suggestions for use of the other parts. Preliminary and follow-up activities are described, as well as those to take place during the workshop. The learner's packet includes materials to be used during the workshop. The last section lists instructional aids--posters and videotapes--and provides TIP (Theory in Practice) sheets and masters for producing overhead transparencies. (YLB)

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Working With Our Publics

In-Service Education for Cooperative Extension

Module 7
Techniques for Futures Perspectives

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Foreword

Welcome to *Working With Our Publics: In-Service Education for Cooperative Extension*. Those who have been involved in developing this project look forward to your participation as a way of bringing it full circle—back to the state and county Extension educators whose requests for help in their changing professional roles initiated the materials you are working with today.

This in-service education series has been supported by the W. K. Kellogg Foundation, ECOP, the ECOP Subcommittee on Personnel and Program Development, ES-USDA, and all of the state and territorial Extension services and their directors. Each of these groups hopes you find the training a rewarding and enjoyable experience.

Working With Our Publics was made possible through its many supporters and participants, a few of whom are mentioned here. Initial support by Mary Nell Greenwood was crucial, as has been the continuing involvement of Administrator Myron Johnsrud. The ECOP Subcommittee on Personnel and Program Development has guided every step of the project. M. Randall Barnett, Terry L. Gibson, W. Robert Lovan, Ronald C. Powers, and Leodrey Williams deserve special mention, as does Connie McKenna, whose untold hours of work and miles of travel made sure it all fell into place.

The expertise, leadership, proficiency, and hours of work devoted to the project by the developers of the seven modules—David R. Sanderson, Richard T. Liles and R. David Mustian, Lee J. Cary and Jack D. Timmons, Laverne B. Forest, Betty L. Wells, Verne W. House and Ardis A. Young, and J. David Deshler, respectively—brought it all together.

It is obvious that *Working With Our Publics* would not have come into being without the financial support of the W. K. Kellogg Foundation. What may not be so immediately obvious is the continuing interest, support, and dialogue provided by the Foundation through its president, Norman A. Brown.

The many state and county Extension professionals who took part in this project as writers, researchers, reviewers, and field test participants in the individual modules are gratefully acknowledged.

As project leader, I would like to acknowledge here the support given to the entire series by North Carolina Agricultural Extension Service Director Chester D. Black. Grateful recognition is given to a long-time colleague and collaborator in many writing projects, Adele P. Covington, who was principal editor for the series. Valuable contributions to the development were made by Joan Wright (California), Lee Hoffman (Washington, D.C.), Brian Findsen (New Zealand), Heriberto Martinez (Puerto Rico), and in the later phases by Janice L. Hastings (New Hampshire), Jo Jones (Ohio), John M. Pettitt, John G. Richardson, and Frank J. Smith (North Carolina). David M. Jenkins, Department Head, and the staff of North Carolina State University's Department of Agricultural Communications deserve special thanks for their outstanding performance in publishing the modules.

Working With Our Publics is designed to increase your knowledge and skills for work with your changing clientele in today's social environment. It also will help you, as a member of the Extension team, to work with the imperative issues facing the Cooperative Extension System, as well as to expand those skills as an Extension educator that are a necessary complement to your other technical and administrative roles.

If you are new to the practice of Extension, we hope that you will view these training materials as a greeting and a gesture of support from those who have gone before you. If you are an experienced Extension educator, we hope that you will enjoy this "literary conversation" with your peers. In either case, we are confident that you will find the information and activities presented here to be timely, stimulating, and practical. After all, they were developed by Extension educators!

Edgar J. Boone, Project Director

Assistant Director, North Carolina
Agricultural Extension Service, and
Head, Department of Adult and
Community College Education

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Raleigh, North Carolina

Overview of the Series

The series *Working With Our Publics: In-Service Education for Cooperative Extension* consists of seven independent training modules. Based upon needs and objectives identified by Extension professionals, the modules are designed to stand on their own as independent instructional packages, or to be used as a comprehensive series. Very briefly, the modules and their authors are:

Module 1: Understanding Cooperative Extension. The history, mission, values, and networks that make the Cooperative Extension System and the land-grant institutions unique. Participants will examine their own expectations, values, and skills, in light of the System's needs, to ensure a good ''fit'' between the individual and the organization. (Nine contact hours of training developed by David R. Sanderson, University of Maine at Orono.)

Module 2: The Extension Education Process. An introduction to, and guided practice in, the premises, concepts, and processes of nonformal Extension education—planning, designing and implementing, and evaluating and accounting for Extension education programs. Both new and experienced staff members who complete this module will understand and be able to apply the programming process as it relates to Extension education. (Twenty-four contact hours of training developed by Richard T. Liles and R. David Mustian, North Carolina State University at Raleigh.)

Module 3: Developing Leadership. How to acquire and exercise leadership skills and how to identify, recruit, develop, and work with community leaders. Intended for all Extension professionals, the module is designed to improve participants' abilities to identify and involve lay leaders in Extension programs and, hence, to develop leadership capabilities among Extension's clientele. (Twelve contact hours of training developed by Lee J. Cary and Jack D. Timmons, University of Missouri at Columbia.)

Module 4: Situational Analysis. How to determine the need for the Extension educator's involvement in issues and to understand the economic, social, political, and environmental contexts in planning, designing, and implementing programs. This module is designed to provide both new and experienced Extension staff members with an appreciation of the role that analysis plays in programming and decisionmaking, as well as the skills to identify, collect, analyze, and use relevant data in the Extension education effort. (Twelve contact hours of training developed by Laverne B. Forest, University of Wisconsin–Madison.)

Module 5: Working With Groups and Organizations. Development of skills in working with and through groups and understanding the behavior of groups, organizations, and agencies. New and experienced staff members who complete their training will be better able to analyze the behavior of individuals, groups, organizations, and governmental agencies. They will gain the skills to build mutually beneficial working relationships, and to deal with networks of influence and key power actors in client communities. (Eighteen contact hours of training developed by Betty L. Wells, Iowa State University.)

Module 6: Education for Public Decisions. In-service education in analyzing public problems, anticipating the consequences of Extension's involvement in issues, and working effectively in areas of controversy. Personnel who play a part in deciding Extension's involvement will build the knowledge and skills needed to design, deliver, and evaluate educational programs on public issues. (Eighteen contact hours of training developed by Verne W. House, Montana State University, and Ardis A. Young, Washington State University.)

Module 7: Techniques for Futures Perspectives. Information and exercises on working with Extension's publics to achieve a proactive stance toward the future through projecting future conditions, analyzing trends, and inventing futures. All participants, particularly those with a background of field experience, will benefit from enhanced capabilities to develop and provide educational programming that helps clients carry out systematic planning for the future. (Twelve contact hours of training developed by J. David Deshler, Cornell University.)

How to Use This Module

This module consists of four major parts, separated into sections in this notebook. Workshop leaders are urged to become thoroughly familiar with each of these parts well before they schedule training.

Sourcebook. The Sourcebook includes a concise, readable synopsis of the Module's content, the objectives of the Module, and a Selected Annotated Bibliography. Separately bound copies of the Sourcebook are available for workshop learners. They may be used as preliminary readings or as follow-up materials after the learners have completed the workshop.

Leader's Guide. The Guide provides step-by-step instructions on how to conduct the workshop. Preliminary and follow-up activities are described, as well as those to take place during the workshop.

Learners' Packet. All materials, other than the Sourcebook, that are intended for distribution to the learners are included in the Learner's Packet. Additional copies may be purchased from the publishers or reproduced locally. Suggestions for when these materials should be used are in the Leader's Guide.

Instructional Aids. The Instructional Aids include posters, videotapes, masters for producing overhead transparencies, and TIP Sheets. Suggestions about when to use the various aids are included in the Leader's Guide.

Edgar J. Boone, Project Director

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Our Module was a team effort here at Cornell. Graduate students Diane Erickson, Nancy Hagan, Frank Healey III, and Kistammah Reddy contributed their enthusiasm, creativity, library search skills, and writing ability. In addition, they developed the videotape, "The Future Starts Today." Deborah Wood contributed her artistic talents as illustrator. Bernice Oltz, our efficient secretary for correspondence and editing, made an essential contribution. Many others on our Cornell Steering Committee gave us suggestions and feedback on our drafts. We especially appreciate the conscientious reactions of Extension subject-matter specialists and County Extension agents, in New York and in North Carolina, who participated in our pilot teaching of the Module materials, and who taught us the many applications and uses of the techniques in this Module.

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Consultants and reviewers were essential to our work. The most helpful and thorough review of our drafts came from Warren Ziegler, Futures-Invention Associates, Denver, Colorado, who helped us with conceptualization and vocabulary. In addition, his work provided the basis for the content in Unit V of the Module. Michael Marien, editor of *Future Survey*, World Futures Society, Washington, D.C., was especially helpful in his review in putting our Module within a historical perspective. We also are grateful to him for writing a literature review, which was incorporated into the Module. Connie McKenna, ES-USDA, Washington, D.C., also was an extremely careful and helpful editor. And to those blind reviewers provided by the Project, we express our thanks. To all these, and others unnamed, and especially our fellow developers who gave us encouragement, we give thanks.

—J. David Deshler
Module Developer

Working With Our Publics
Module 7: Techniques for Futures Perspectives

Sourcebook

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Unit I. Techniques for Futures Perspectives

Introduction

Since the beginning of recorded time, human beings have been curious about the future. The Greeks visited the oracle of Delphi, and the Hebrews listened to (and sometimes silenced) their prophets who proclaimed the future through reading the "signs of the times" or interpreting dreams. Many persons consult psychics, tarot cards, tea leaves, and the palms of their own hands, as well as mystics and newspaper astrologers. Some religious groups proclaim the end of the world, while other groups see us at the beginning of some vaguely described new age. Yet, every day people in responsible positions in our society—in business, agriculture, commerce, human service, military service, and government —make decisions that can have profound effects on the future, and must select futures perspectives to guide those decisions. Often the decisions are impromptu and decisionmakers fail to recognize long-term consequences. Other decisions are based on our assumptions about likely consequences, and the vision of the future that we desire. Gazing ahead is not simply a hobby or a luxury enjoyed by utopians. It is a necessity for our survival on this planet. Some decisions, made without an eye to the future, can produce irreversible damage. Other decisions may provide us with unprecedented opportunity. If we can anticipate consequences, learn to adapt, to cope, and to invent, we can begin to make decisions with regard to both the present and the future. And, we can do this by means that are much more reliable than tea leaves and crystal balls.

Because we now have incredible power to alter our planet in so many ways, it is essential that we learn to anticipate the negative consequences of lifestyles, technologies, and public policies. We must generate positive visions of the future that can inspire and motivate us to sustain life and the planet's resources for future generations. Such positive visions are a key factor in society's capacity to change; its most valuable asset; and an important element for survival. We need to explore potentially powerful approaches for enhancing our abilities to view the future and engage in bringing about positive change (*The Future of Education*, 1981).

Public and governmental interest in serious futures study and strategic planning tends to come and go. The language changes. Futures interest in one decade goes under the banner of futures studies, while in the next it is described as policy science or strategic planning. "Think tanks" rise and fall as do subscriptions to magazines that focus on the future. During the 1960s and 1970s there was considerable evidence of public interest in futures studies (Amara, 1975; Cornish, 1977). During the 1980s, this interest waned, as evidenced by declining publications of major books. As we approach the turn of the century, there probably will be a revival of popular interest. However, the consequences of being blind to the future continue to take a steady toll, regardless of the strength of popular interest (Kahn et al., 1976; Helmer, 1983).

Cooperative Extension's Opportunity and Role in Futures Perspectives

Cooperative Extension, at the national and state levels, is increasingly recognizing that a futures perspective is now more important than in previous history. This change in perspective is predicated on accelerated change, the irreversible consequences of new technology, and the increasing interdependency of what we do and what others do around the world.

In response to this situation, Cooperative Extension is placing greater emphasis on learning different approaches that enable the organization and its publics to use futures perspectives in personal, organizational, and social situations. **Module 7**:

Techniques for Futures Perspectives is one evidence of this response. The content of this Module draws upon the work of futures researchers and educators over the past 20 years. During that time, a number of techniques for viewing the future have been developed, and the most useful are presented in this Module.

Cooperative Extension can use techniques for generating futures perspectives for its own organizational strategic long-range program planning and development, as well as with its publics. Individuals, families, groups, organizations, and public policy decisionmaking bodies can all generate perspectives for the future. In the past, the land-grant institutions have provided Cooperative Extension with research findings to disseminate and apply to problems and situations of its constituencies. More recently, some of the land-grant institutions have developed a variety of methods and techniques for viewing the future. These resources can provide technical backup to Extension's use of techniques for futures perspectives.

Cooperative Extension has a long and distinguished tradition of teaching leadership and process skills to its publics, including "creative problem solving." Techniques and methods for futures perspectives will add to this repertoire of methods that can be used by various groups. Teaching these recently developed techniques will give Cooperative Extension a bold new leadership role among educational providers. This type of assistance will enable some publics to avoid "learning by shock"—waking up unprepared to face the consequences of rapid social and technological change. Individuals and groups can engage in new forms of learning so that they can anticipate change and participate in shaping the future, rather than being victims of it (Marien and Zeigler, 1972; Botkin et al., 1979).

To summarize, techniques for futures perspectives provide Cooperative Extension with a unique and important educational opportunity and role. These techniques can (1) extend leadership competencies and process skill programming; (2) help Extension's publics avoid learning reactively from shock; (3) increase the pool of informed citizens; (4) build bridges among technologists, decisionmakers, and the general public; and (5) provide realistic, alternative visions that fall between unsupported despair and naive enthusiasm about the future. It is feasible for Extension to use these techniques because they (1) can be applied to its own organization as well as to its publics' situations; (2) can be supported by futures research and planning methods of land-grant institutions; and (3) can increase Extension's capacity to perform the broad range of process roles in which it has traditionally been engaged.

Public Participation

Why is it important for Cooperative Extension's publics to be involved in generating futures perspectives? Why should this activity not be left to the "experts"? The following reasons explain why broad public participation is important.

Access to Methods and Information

The first reason for broad public involvement in futures education is that people have a right to know about what will affect their lives. In recent years, some governments and universities have established "think tanks" to study the future. Some of the think tanks have focused on military strategy; others have directed their interest to more general policy concerns. Although some writers believe that a new profession for studying the future is emerging (Waskow, 1973; McHale, 1978), there is no reason for experts to have a monopoly in this area. The study of the future differs from other disciplines, such as chemistry or astronomy, in that the future depends on human action. Our knowledge of celestial mechanics has little influence on the movements of the stars. However, as members of society, our knowledge from futures studies and our decisions can influence the future of the world, in a very real sense. Therefore, members of society should have access to the methods as well as the information generated. The Cooperative Extension System has been, and can remain in the future, a guardian of the people's right to have access to information through their land-grant institutions.

Contribute to Planning

A second reason for involving the public is that persons who have no technical background can contribute much to studies of the future (Friedman, 1973). They can participate by collaborating with experts, contributing data, learning about the results of studies, and providing feedback on alternative possibilities and choices. However, their major contribution is creating visions and images of the future, and taking action to influence the future. All people, regardless of their levels of educational attainment, can do this on an equal footing with technical experts, because the ingredients needed here are values, reflectivity, imagination, and commitment (Michael, 1973).

Protect Public Interests

Another reason to include the public in generating futures perspectives is that involving the public is one way to protect its interests and the interests of future generations. We pride ourselves on having an open society. That open society is made possible not only by the press, but by the active involvement of people who are alert to threats against the common good and a sustainable future. Government by special-interest groups alone will not assure justice for all or the protection of future generations.

Create an Informed Public

Involvement of members of society in studies of the future may contribute to an informed public. This is essential to a political climate that will not let negative, unanticipated consequences slip by. The gap between laymen and technologists must be reduced, but this means that more people will have to understand the complexity and interdependence of our world. By using techniques for futures perspectives, the public can contribute to a new consensus about what a responsible social and environmental ethic should be. A positive future is more likely if the society has members who are engaged in studies of the future.

Envision Futures

Some argue that the most powerful way to achieve social change is to imagine a desirable future in vivid detail. Envisioning fosters greater acceptance of change and the adoption of positive innovations. Laymen may be better equipped to do this than the technological elite, since they represent those who are most likely to be affected by choices. Including both the contributions of members of society and those of futurists and planners is more likely to provide an adequate basis for desirable images and visions (Bundy, 1976; Loye, 1978).

The technical approach to planning tends to emphasize technical solutions, limited involvement of the public, and responsiveness to the political and economic elite. Cooperative Extension's mission can complement the technical approach by using the public resources of the land-grant institutions to involve Extension's publics in participatory research and planning.

Content Sources for This Module

Some of the techniques for futures perspectives included in this Module are drawn from research methods of the physical, natural, and social sciences. Others come from the world of business and industry. Public demand for technological, environmental, and social risk studies has led to the creation of designs for assessing many projects prior to their being implemented. Attempts to generate global perspectives have taught us much about the limitations and possibilities of computers in viewing the future. A few futurists have stressed the importance of intuition, imagination, and the power of social ideas in shaping the future. The content of Module 7 is eclectic, in that it is drawn from all of those sources. At the same time we have attempted to synthesize those varied sources into practical, easy to use suggestions for the Extension educator.

Incentives for Generating Futures Perspectives

The underlying assumptions in this Module are that it is desirable (1) for the Cooperative Extension System to develop its own futures perspectives and (2) to assist its publics in generating futures perspectives. Incentives for generating futures perspectives include:

- Creation of worthwhile goals,
- Expansion of options and alternative possibilities,
- Motivation for action based on a compelling vision of the future,
- Utilization of emerging opportunities,
- Promotion of curiosity and imagination,
- Prevention of negative unanticipated outcomes,
- Redemption of past human error and destructiveness,
- Protection of benefits for future generations,
- Generation of a planetary ethic, and
- Preservation of a common good.

Purposes of Module 7

The overall purposes of Module 7 are:

1. To enhance the capabilities of Cooperative Extension personnel to understand and use alternative techniques for generating futures perspectives as part of their educational programming; and
2. To assist Cooperative Extension's various publics, groups, and organizations in learning and using these techniques for generating their own futures perspectives.

Working Definition of Techniques for Futures Perspectives

In this Module, we are using the following definition of techniques for futures perspectives:

Techniques and futures perspectives include any systematic activities or processes that:

- Increase our motivation to anticipate and learn about the future;
- Improve our understanding of trend implications;
- Alert us to anticipated consequences of actions, plans, decisions, and policies; or
- Enhance our vision of a desirable future toward which our activities can be directed.

Educational Objectives

Techniques for Futures Perspectives is designed for Cooperative Extension personnel at all levels of the System and for both new and experienced staff. The content builds upon all the other modules in *Working With Our Publics*. However, Module 7 should be viewed as a major extension to the content and skills taught in

Module 4: Situational Analysis. The techniques described in Module 7 can be applied to Cooperative Extension's own organization as well as to individuals, families, groups, organizations, and to the public policy decisionmaking situations of Extension's publics. Some of the futures perspectives that can be generated through the use of techniques described in Module 7 can be viewed as contributing to the process described in **Module 6: Education for Public Decisions**. The techniques that are taught in Module 7 are intended to make a special, unique contribution to the overall program development process that Cooperative Extension uses with its many publics.

Approaches for Generating Futures Perspectives

Four major approaches to generating futures perspectives emerged upon study of the literature of futures research and action methods.

The first approach is to increase *anticipatory learning.* This activity awakens persons to the necessity of learning to think with a future orientation; to understanding the plans, visions, and possibilities that others have created; and to stimulating dialogue concerning decisions about the future. The learning process is aimed at liberating people from socially imposed and unexamined expectations regarding the future, and toward evaluating ethical and moral decisions that have an impact on the future of our planet. The major techniques selected to introduce anticipatory learning include self-directed learning from futures literature, visual media analysis, futures fiction reflection and dialogue, and the use of futures games and simulations.

Projection and forecasting is another important approach with specific techniques for viewing the future. The usefulness of projection and forecasting is obvious. Accuracy is more likely if historical precedents exist; regularities of cause and effect are known; quality data are available; and the projected time span is short. The basic assumption underlying forecasting is that each forecaster begins with hypotheses about the relationships of the past to the present, and then uses records to make projections into the future. Techniques for projection and forecasting in this Module include Delphi, trend extrapolation, cross-impact analysis, and computer modeling.

The third approach for futures perspectives is *prevention and adaptation.* The basic assumption in this approach is that futures perspectives are important to prevent potentially undesirable, hazardous, or unintended consequences of present decisions. This orientation and activity are especially important when plans to alter the physical or social environment are proposed, or when specific technologies or policy changes are introduced. The assessment may call for subsequent adaptation, limitation, adjustment, or abandonment of proposals. Techniques for prevention and adaptation that are briefly explained in this Module include economic, environmental, and social impact assessments, as well as technology and risk assessment.

The fourth approach for futures perspectives is *invention and creation.* The primary focus of this activity is on challenging mental barriers to the use of creative intuition for the construction of visions or plans for a desirable future. Techniques that serve this purpose assist the users in imagining new possibilities that otherwise would not be considered, because of our human tendency to be bound by what we already know. The major assumption here is that one begins by generating a vision or goal and then develops strategies to fulfill that vision. Invention and creation techniques selected for this Module include preference surveys, values audits, images and imagining, scenario building, futures history writing, and action planning.

To summarize, these four approaches for generating futures perspectives can (1) awaken us to the necessity and benefits of learning to think with a future orientation; (2) lead us to examine the implications of future trends for our activities and lives; (3) help prevent undesirable, hazardous, or unintended outcomes by ensuring that we appreciate the potential risks and consequences of proposed development, policies, products, and plans; and (4) help us invent, create, and focus on new visions, possibilities, and goals for a desirable or preferred future that will motivate us; attract resources; and move us to new actions in the present.

These four approaches for generating futures perspectives are the organizing structure for the content of this Module. Each will be addressed, in turn. However, most actual planning situations require the use of several techniques in combination. In Unit VI, the last unit of this Module, we address the task of selecting appropriate techniques for different types of situations.

Results Expected from Module 7

The training materials in Module 7 are addressed to Cooperative Extension professionals as the primary audience. It is anticipated that many Extension educators will, in turn, use these training materials as resource materials, with Extension's publics as a secondary audience. As designers of Module 7, it was our intention that, upon completion of the training, you, as an Extension administrator or educator, will:

- Comprehend the educational role that Cooperative Extension can assume through the use of techniques for futures perspectives;
- Recognize and appreciate differences in the time perspectives of cultures and age groups;
- Hold a broad overview of futures literature and representative techniques for futures perspectives;
- Value a future orientation and vision of your work, and be committed to using techniques to generate futures perspectives;
- Know the four complementary approaches for futures perspective techniques (anticipatory learning, projection and forecasting, prevention and adaptation, and invention and creation);
- Recognize which techniques for futures perspectives are useful for specific situations; and
- Be able to introduce, recommend, teach, and facilitate the use of techniques for futures perspectives to enhance the capacity of Extension's publics to influence future outcomes.

Unit II. Anticipatory Learning

Unit II contains (1) an introduction to the concept of anticipatory learning, (2) a consideration of differences among personal time perspectives, (3) an overview of self-directed learning of futures literature, (4) a survey of future-oriented visual media, (5) a consideration of the value of fictional futures as an anticipatory learning aid, and (6) a description of several future-oriented games and simulations. All of these concepts and techniques are intended to overcome any resistance we may have to viewing the future and to encourage us to learn through anticipatory perspectives.

Introduction to Anticipatory Learning

How can education be used to overcome resistance to viewing the future? How can we help Extension's publics view the future as a challenge and an opportunity? How can an educational emphasis on the role of human choice assist our publics in seeing the importance of investing in the creation of alternative futures? One way is to think of education as helping people avoid having to "learn by shock" (Botkin et al., 1979).

Few of us experienced anticipatory learning during our formal schooling. Schools traditionally have been viewed as mirrors of the society, reproducing social values rather than modifying or effecting change in society. More recently, educational institutions, including schools, have been viewed by some as vehicles for social change. A few educational institutions now emphasize anticipatory, future-oriented learning. Some professional educators have been engaged in future-planning studies (Hencley and Yates, 1974; Grabowski, 1977; Harrington, 1977; Bowman et al., 1978; Becker et al., 1979).

Programs that emphasize futures perspectives have been introduced into a few public elementary and secondary schools (Rubin, 1975, 1978). Some state Extension services are engaged in strategic planning. A scattering of universities have established master's and doctoral programs in futures research: Fairleigh Dickinson University, Rutherford, New Jersey; Portland State University, Portland, Oregon; San Jose State University, San Jose, California; Massachusetts Institute of Technology, Cambridge; University of Houston, Clear Lake City, Texas; University of Massachusetts, Amherst; University of Minnesota, Minneapolis; and the University of Southern California, Los Angeles, to name a few (Shane and Weaver, 1978). Policy studies and strategic planning are emphasized at a large number of universities (Theobald, 1972). The Cooperative Extension System is in the process of moving from a reactive mode of educational delivery to a proactive, anticipatory mode. Such an emphasis means that we, as Extension educators, do not wait until our publics experience severe needs and then respond. Rather, we assist our publics to anticipate the future and influence future conditions. Anticipatory learning is not a new program area for Extension, but a way of viewing all program areas in a proactive mode. Anticipatory learning techniques can help us overcome our tendency to "learn by shock," and our resistance to thinking about the future.

Purposes of Anticipatory Learning

Anticipatory learning techniques are aimed at freeing persons from socially imposed notions and unexamined expectations and thoughts regarding the future. This type of learning experience also provides persons with the opportunity to assess ethical and moral decisions that impact on individuals, families, communities, and the future of the world. The purpose of anticipatory learning techniques is to broaden learners' perspectives and world views. Proponents of anticipatory learning techniques suggest that their use will heighten reflection, empathy, imagination, and cultural sensitivity. The need for such learning is great, because the future of the world depends on the capacity of people to take a holistic perspective to prevent environmental erosion and war, and to create a quality of life for future generations.

Capacities for Anticipatory Learning

Anticipatory learning requires the capacities to (1) overcome resistance to considering the future; (2) reflect on our social assumptions about the future; (3) imagine future conditions toward which human energy can be directed; (4) evaluate the long-term consequences of present decisions by considering side effects, unintended surprise effects, and early warning signs of potential problems; (5) recognize relationships of multiple as well as single causes to the big picture of events; and (6) make, monitor, and modify plans and strategies for the future. This type of thinking is essential for all people in a democracy, if we are to create a future that is just and sustainable, and that provides a quality of life.

Avoidance of Having to "Learn by Shock"

There are several negative consequences to the avoidance of thinking about and studying the future. Such avoidance may lead to "muddling through," or making decisions according to what is easiest to implement. "Band-aid" measures are taken easily, with no thought about long-term effects. Failure to consider the future may lead us to self-serving solutions that ignore the well-being of future generations. In contrast, long-term futures perspectives are more likely to lead to solutions that are sustainable.

In addition, failure to become involved in generating futures perspectives for ourselves, our communities, and our world defers decisions to others, and makes us victims of the consequences of others' choices. Deferring decisions is one way that we give away our power of influence on what happens in the future. On the other hand, those who engage in thinking about the future are less likely to feel completely powerless. Empowerment is dependent upon a future orientation and one's capacity to influence the future through planning.

The primary result of future thinking avoidance is "learning by shock," that is, waiting until some disaster or need occurs before being willing to learn. "Learning by shock" is reactive, rather than proactive. It has been costly throughout human history, but, up to this point in time, people could afford to "muddle through," because the consequences generally affected specific places and the generation that made those short-sighted choices. With the power of today's technology, failure to anticipate some irreversible consequences can threaten all people, and future generations on this planet. We no longer can afford to "learn by shock." Furthermore, relying on the knowledge of the past no longer is sufficient. We must construct knowledge. What is called for is learning that goes beyond responding to problems as they emerge. There is a need for "anticipatory learning" (Botkin et al., 1979). Anticipatory learning helps us to know how to view the future so that we can influence and create it, rather than be victims of its unanticipated consequences.

Personal Time Perspective Differences

Not everyone will be immediately interested in learning about techniques for generating futures perspectives. In fact, there may be considerable resistance from some of Extension's publics. Why is this so? McHale (1978) states that individuals, cultures, and societies may have identifiable time orientations toward the past, the present, or the future.

Sork (1980) describes three concepts that have been used by researchers to measure differences among persons and groups in times perspectives. Persons whose *dominant temporal perspective* is the past or the present may view these time periods as relatively more significant or important, and they subsequently have little interest in the future.

The second, *density of temporal perspective,* refers to the extent that persons perceive eventfulness of various time periods. Some persons may perceive their past as being very dense or eventful; others may perceive the present or the future to be laden with eventfulness.

Still another distinction is the length or *extension of time perspective* that people use when thinking about time spans in the past, present, or future. Some tend to define the past as the past 10 years of their lives; others may consider the past to include 200 years of American history, or all of world history. For some people, the present includes this year, for others it includes only today or this very hour or minute. Similarly, the future may mean next week to one person and the next 100 years to another.

Singer (1974) views persons who are oriented toward the future as having a "future focused role-image." When one considers the foregoing three temporal distinctions in light of the future focus, it is easy to recognize that individuals, groups, societies, and cultures could differ widely with regard to the way they view the future and the importance they give to doing so.

Age is another variable that affects one's perspective on time. Green (1975) proposes a series of developmental stages that individuals go through on their way toward temporal maturity. Each stage reflects a different orientation to time. Her proposed stages and corresponding age ranges are the following:

1. *Permanence of objects and persons (during year 1).* During this period, there is little evidence in children that time and change are related.

2. *Clock time (1–3 years).* We become aware that people act, based on what time is, according to the sun or a clock.

3. *Restriction time (3–5 years).* We recognize that we may not be permitted to do some things because of the time of day.

4. *Causal sequences (6–11 years).* We become aware that doing things in a particular order may make things easier or more difficult.

5. *Personal time (12–15 years).* We realize that we have a personal past, and we begin to think about our personal future.

6. *Mutual time (15–25 years).* We come to appreciate that time shared with others can decrease our personal isolation.

7. *Alternatives in time (18–25 years).* We recognize that choices in the use of our time profoundly affect our personal future.

8. *The uses of time (25–40 years).* We come to terms with the conflict between our personal time preferences and the use of time demanded by our commitments and the expectations of society.

9. *Reconsidered time (40–50 years).* We evaluate our lives to date, and reflect on how our decisions on time should be made in the future.

10. *The foreshortened future (50–60 years).* We realize that only a short proportion of subjective time is left to us, and we want to use it to achieve unattained goals.

11. *The rich past (beginning at about age 65).* We recount events and pass judgment on our actions.

According to Green, research findings suggest that a future orientation is more likely between the ages of 20 and 50.

Sork (1980) notes an important relationship between social class and time perspective suggested by research findings; middle-class persons tend to have a more widely extended future orientation than do lower-class persons, perhaps because middle-class persons do not have to struggle for survival on a day-to-day basis. In addition, cross-cultural studies show that cultural differences account for variations in future perspectives. For example, the culture of many Native Americans requires them to consider consequences for seven future generations, when making decisions concerning the tribe or the environment. Conversely, elected officials tend to live in a culture that views time from one election to the next.

In addition to the variables of age, social class, and culture, reflection on the future can be uncomfortable. Thinking about the future may increase (1) awareness of one's own eventual death or the possibility of nuclear war; (2) rejection from others who do not want to consider possible future bad news; (3) fear about perceived changes that may become necessary; (4) uncertainty regarding unanticipated events and conditions; and (5) guilt over possible negative consequences from past decisions. Persons may avoid thinking about the future by procrastinating; following routines, customs, and rules to avoid serious thought; resigning themselves to fate; or trusting their fate to authorities and hoping for technological miracles.

Can we determine the extent of our own anticipatory learning perspective as Extension educators? Patton (1986) provides a self-administered 15-item quiz for Extension educators on what he terms a "Futures Quotient" (FQ). The quiz provides an opportunity for self-reflection on the qualities of people who have developed a futurist perspective. The qualities include:

- Balanced perspective—not overly optimistic or overly pessimistic;
- Empirical perspective—follows statistical trends and qualitative patterns;
- Belief in the possibility of creating the future;
- Innovative—likes to try new things, try on new ideas;
- Intellectually and emotionally stimulated by consideration of futures;
- A global, universal perspective;
- Comfortable with and challenged by ambiguities, uncertainties, and the unknown;
- Imaginative;
- Modest about, but willing to make, predictions;
- Seeks information from multiple and diverse sources;
- Calculated and careful risk taker;
- Holistic, big-picture perspective;
- Process-oriented without need for definitive endpoints and precise answers;
- Creative, and
- A futurist by self-definition.

Are there activities and techniques that can help us to overcome our resistance to thinking about the future and to become anticipatory learners? Yes, there are a number. Four types of such activities are outlined in this unit: (1) self-directed learning from futures literature; (2) future-oriented visual media analysis; (3) fictional futures literature: reading and dialogue, and (4) future-oriented games and simulations.

Overview: Self-Directed Learning of Futures Literature

Although the focus in this Module is on techniques for futures perspectives, the Extension educator should be aware that the content is only a brief introduction to a very limited segment of the futures literature. Michael Marien, editor of *Futures Survey*, provided as an instructional resource for this Module, an article titled, "Touring Futures II: A Literature Guide to Futures Studies for Cooperative Extension." An earlier version of this

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guide was originally published in *The Futurist* (April, 1983) as "Touring Futures: An Incomplete Guide to the Literature." "Touring Futures II" contains a brief description of the major books that give us the "big picture" of what is changing; where we may be headed; and what we can do.

Following a discussion of seven tips for tourists, "Touring Futures II" contains an overview of four different tours, general areas that should be considered for at least a short visit: (1) overviews, (2) society and technology, (3) natural resources, and (4) human resources. Each tour lists from 15 to 25 major works for introductory self-directed reading. Marien suggests that touring alternative views of probable, possible, and preferable futures may be one of the most important learning projects for any American to undertake.

The World Future Society provides a wide variety of educational resources for self-directed learning. Their magazine, *The Futurist,* is a publication with which most persons are familiar. However, the *Future Survey,* a monthly abstract of books, articles, and reports concerning forecasts, trends, and ideas about the future, published by the World Future Society, is probably the best single publication for keeping up with futures literature. It is especially helpful in providing abstracts for specific problem areas. We highly recommend that all Extension professionals gain access to this publication as the basis for their continuing education in planning and futures literature. The address for ordering this publication appears later in this unit under the heading "Fictional Futures Reference Guides."

Futures-Oriented Visual Media Reflection

The commercial film industry has earned millions of dollars by adapting fictional futures literature into films and videos. Our culture has become a visual one, and is rich in visual media resources. Some rock and country music videos are visionary, and challenge our assumptions of reality. One of the challenges to Cooperative Extension is the task of harnessing this cultural attribute to educational purposes that fit its mission.

Purposes of Visual Media

Visual media can be used to (1) facilitate the use of creativity and intuition in visualizing positive futures; (2) compare alternative futures that have been visualized in the media; (3) make judgments regarding preferences and values of future conditions and goals; and (4) identify and examine ethical and moral issues. This latter purpose is based on the assumption that media often reflect cultural sensitivities and are good data sources to be analyzed by parents, youth, and other lay persons. Discussions can follow concerning what the viewers see happening to society. Subsequently, participants can engage in creating goals toward which they are willing to work.

Procedures

The following procedures can be used with almost any type of visual medium as a way to spark futures-oriented reflection and discussion.

- Prior to viewing the visual media, provide participants with questions similar to the following: (1) What positive or negative feelings about the future does this film or videotape call forth? (2) Which alternative vision of the future do you agree with? (3) To what extent does the content present an accurate projection or forecast? (4) To what extent does the content alert you to potential consequences you wish to avoid? (5) What ethical or moral issues are suggested? (6) What new creative images of the future are stimulated by viewing the film or videotape?

- Following the viewing, encourage participants to share their observations, judgments, concerns, and imaginative responses with their peers, using their answers to the questions as a starting point.
- Ask participants to identify decisions that they can make or influence. Do this in relation to a salient issue or problem that emerged from the discussion.

Futures Film and Videotape Information Sources

Finding futures-oriented films and videotapes for specific groups and situations can be time consuming and difficult. The following information sources can be very helpful:

Budget Films. 4590 Santa Monica Blvd., Los Angeles, Calif. 90029.

Consortium of University Film Centers. (Film libraries at 100 participating universities throughout the U.S. provide unified lending policy information for all films listed under the Consortium label).

Educational Film Locator of the Consortium of University Film Centers. 2nd ed. (1980). R.R. Bowker Co., New York and London.

Feature Films Directory. 8th ed. (1985). R.R. Bowker Co., New York and London.

Films Incorporated, 5547 N. Ravenswood Ave., Chicago, Ill. 60640 or 440 Park Avenue South, New York, N.Y. 10016.

McGraw-Hill Training Systems. P.O. Box 641, Del Mar, Calif. 92014.

Media Collections and Services. (1976). R. R. Bowker Co., New York and London.

National Information Center for Educational Media (NICEM). P.O. Box 40130, Albuquerque, N.M. 87197.

SAI Productions, SAI Media. Sterin and Associates, Inc., 1629 Forest Drive, Suite 302, Annapolis, Md. 21403

Swank Motion Pictures, P.O. Box 231, St. Louis, Mo. 63166.

The Video Sourcebook. 7th ed. (1985). National Video Clearinghouse, Inc.

Warren, B. (1982). "Keep Watching the Skies!" *American Science Fiction Movies of the Fifties,* Vol. 1. Jefferson, N.C.: McFarland and Company.

Willis, D.C. (1982). *Horror and Science Fiction Films, II.* Metuchen, N.J.: The Scarecrow Press.

World Future Society, 4916 S. Elmo Avenue, Bethesda, Md. 20814.

Most video rental centers have extensive collections of science fiction films. It is usually far less expensive to rent videotapes than feature 16mm films.

Examples of Futures Films and Videotapes

Capricorn One. 127 min color (1978). Rental: Swank Motion Pictures, Box 231, St. Louis, Mo. 63166.

The China Reaction. 87 min color video (1980). Rental: Embassy Home Entertainment, 1901 Ave. of the Stars, Los Angeles, Calif. 90067.

The China Syndrome. 122 min color (1975). Rental: Arcus Films, Inc., 1225 Broadway, N.Y. 10001. Budget Films, 4900 Santa Monica Blvd., Los Angeles, Calif. 90029. Contact your local video center.

Cities of the Future. 25 min color (1967). Rental: Consortium of University Film Centers. 2nd ed. (1980). R.R. Bowker Company, New York and London.

Clockwork Orange. 137 min color (1971). Rental: Swank Motion Pictures, P.O. Box 231, St. Louis, Mo. 63166.

Embryo. 103 min color (1976). Rental: Swank Motion Pictures, P.O. Box 231, St. Louis, Mo. 63166.

The Food Revolution. 20 min color (1975). Columbia Broadcasting System, 383 Madison Ave., N.Y. 10017. Consortium of University Films Centers. McGraw-Hill Training Systems, P.O. Box 641, Del Mar, Calif. 92014.

The Four-Day Week. 25 min color (1967). National Broadcasting Co., 30 Rockefeller Plaza, N.Y. 10020. Consortium of University Films.

Futureprobe I: The 21st Century Home;Futureprobe II: Business in the Telematic Age; Futureprobe III: Tomorrow's Money. 60 min color videos (1986). Rental: SAI Productions, 1623 Forest Drive, Suite 302, Annapolis, Md. 21403.

Future Shock. 42 min color (1972). Rental: Available at all film libraries listed here.

Goodbye Gutenberg. 90 min color (1982). Rental: Films, Inc., 5547 N. Ravenswood Ave., Chicago, Ill. 60640.

Ground Zero. 50 min color video. Rental: University of Michigan, Media Resources Center, 400 Fourth Street, Ann Arbor, Mich. 48109.

The Human Influence. 20 min color (1985). Films for the Humanities, P.O. Box 2053, Princeton, N.J. 08543.

Man Made Man. 26 min color (1967). Columbia Broadcasting System, 383 Madison Ave., N.Y. 10017. Consortium of University Film Centers.

Metropolis. 30 min black and white (1963). Encyclopedia Britannica Education Corp., 425 N. Michigan Ave., Chicago, Ill. 60611. Consortium of University Film Centers. Films, Inc. 5547 N. Ravenswood Ave., Chicago, Ill. 60640.

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The Metropolis (parts 1 and 2). Based on the book, *The Age of Uncertainty.* J.K. Galbraith. Dist: Films, Inc., 733 Green Bay Rd., Wilmette, Ill. 60091.

Miracle of the Mind (rev. ed.). 25 min color (1968). Columbia Broadcasting System, 383 Madison Ave., N.Y. 10017. Consortium of University Film Centers. McGraw-Hill Training Systems, P.O. Box 641, Del Mar, Calif., 92014.

Modern Times. 90 min black and white (1936). Wayne State University, Center for Instructional Technology, 77 W. Canfield Ave., Detroit, Mich. 48202.

Network. 120 min color (1977). Dist: United Artists Entertainment, 729 Seventh Ave., N.Y. 10019

One Hour to Zero. 56 min color (1980). Dist: Lucerne Films, Inc., 37 Ground Pine Road, Morris Plains, N.J. 07950.

Planet of the Apes. 122 min color (1968). Rental: Film or video, Films, Inc., 733 Wilmette Ave., Wilmette, Ill. 60091.

Sleeping Dogs. 107 min color. Sale: video, Vidamerica, 235 East 55th Street, N.Y. 10019.

Soylent Green. 97 min color (1973). Rental film or video: MGM, United, 1350 Ave. of the Americas, N.Y. 10019. Swank Motion Pictures, P.O. Box 231, St. Louis, Mo. 63166.

Stranger Than Science Fiction. 25 min color (1969). Columbia Broadcasting System, 383 Madison Ave., N.Y. 10017. Consortium of University Film Centers. McGraw-Hill Training Systems, P. O. Box 641, Del Mar, Calif. 92014.

The Third Wave. Color. Video production taken from A. Toffler's book by the same name. Producer: Public Broadcasting System, Boston, Mass.

Thunder in the City. 60 min black and white (1937). Rental: Budget Films, 4590 Santa Monica Blvd., Los Angeles, Calif. 90029; Mogulls Films, 1280 North Ave., Plainfield, N.J. 07062.

Tomorrow. 30 min black and white (1961). United Church of Christ, University of California, Berkeley.

The Ugly Little Boy. 26 min color (1977). The Learning Corporation of America, 108 Wilmot Road, Deerfield, Ill. 60015.

We. 29 min color (1973). Dist: U.S. National Audio Visual Center, General Services Administration, Washington, D.C. 20409

The Weird World of Robots. 25 min color (1968). Columbia Broadcasting System, 383 Madison Ave., N.Y. 10017. Consortium of University Films. McGraw-Hill Training Systems, P.O. Box 641, Del Mar, Calif. 92014.

Filmstrips:*Newsweek's 2000 A.D.;* Doubleday's *Change Here for Tomorrow, Dimensions of Change, Economics and the Future,* and *The Population Debate.*

Visual Media Example Situations

A Cooperative Extension conference on the future of electronic media as the methodology of choice for agriculture education programs is being held. Future-oriented films that feature management uses of computers and expert systems are scheduled. After the films are shown, there will be discussion of specific proposals for improvement of electronic media use in agriculture in the Cooperative Extension System.

A state Extension service is planning a conference on the future of the family farm in the U.S.A. The planning committee decides to provide a film series at the conference that will help participants to view the long-term future of agriculture and to pose hard questions about consequences to family values.

4-H program planners have gathered at the state level to consider the future of 4-H. They feel limited in their capacity to imagine the world that today's adolescents will inherit when they reach middle age. Thus they feel inadequate to design programs that will help today's youth prepare for the future. One 4-H program specialist suggests that there are several futures films describing potential choices that persons may have to make regarding possible future life-styles.

A commission on the future of Cooperative Extension has been appointed by the State Extension Director. The chairperson suggests that the group view several futures films that provide images of the future to stimulate the group's imagination in considering future program priorities.

Fictional Futures Literature: Reading and Dialogue

Most people know fictional futures literature as "science fiction." However, Marien (1979) calls it "fictional futures," because most of these novels include a good deal of social science. According to Marien, science fiction tends to be set in the far future and often involves adventures in outer space, while social science fiction tends to look at the near future and to be earth-based. Both types can be helpful to anticipatory learning.

Some futurists believe that reading and dialogue on fictional futures provide subjective and emotional content. The fiction can be an alternative means of capturing realities, a necessary complement to the more quantitative tools of projection and forecasting. Using intuition, perception, and reasoning, this fiction attempts to create believable futures that depict the interactions among science, technology, and society. These fictional future scenarios, therefore, can provide early warnings of potential problems, and can raise expectations about positive futures. Livingston (1978) points out that fictional futures reading and dialogue not only are ways to obtain a variety of alternative visions of the future, but also can influence the present by mirroring and shaping changes that are taking place in society.

Types of Fictional Futures Stories

Fictional futures can be categorized according to the premises upon which they are based. Livingston (1978) outlines four major types. Stories may be based on:

- A society of increased material wealth that is generated by technological progress. The stories offer a "surprise-free" vision of postindustrial societies. Often these stories

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offer a critical treatment of present society by criticizing the popularity of "disposable possessions."

- An alternate economic and political arrangement to that which presently exists. Stories often challenge the prevailing notion of a nation-state system and prevailing social stereotypes.
- An exploration of what society would be like if social norms, values, or roles were reversed, changed, or challenged. In recent years, gender stereotypes have become targets of attention in futures fiction writings.
- Implications of radical changes in society due to increasing dependence on, or consequences of, technology.

Procedures

The procedural steps suggested for reading and dialogue in the fictional futures literature exercise are:

1. Obtain commitment from the group to read a story, in common, for a specific purpose.

2. Identify the dilemmas, values, or ethical issues that the group seeks to explore.

3. Select a common fictional futures work, using reference guides as a source.

4. Readers take notes on issues, images, values, and choices that the novel illustrates.

Fictional Futures References Guides

Fictional futures is larger than any other type of futures literature. Fortunately there are several reference guides that are helpful in making selections and in locating stories that can become the basis for reflection and group discussion. The following reference guides are a starting point to classic fictional futures:

- Asimov, Isaac (ed.). 1971. *Where Do We Go From Here?* Garden City, New York: Doubleday.
- Barron, Neal (ed.). 1981. *Anatomy of Wonder.* 2nd ed. New York: R.R. Bowker Co.
- Calkins, E., and B. McGhan. 1972. *Teaching Tomorrow: A Handbook of Science Fiction for Teachers.* Dayton, Ohio: Pflaum Publishers. (Provides a synopsis of over 200 science fiction works.)
- Conklin, G. 1962. *Great Science Fiction by Scientists.* New York: Collier Books.
- Ferman, Edward L. 1970. *Twenty Years of the Magazine of Fantasy and Science Fiction.* New York: G.P. Putnam's Sons.
- *Future Survey.* Journal of the World Future Society, 4916 St. Elmo Ave., Bethesda, Maryland 20814.
- Ginsburg, Mirra. 1970. *The Ultimate Threshold: A Collection of the Finest Soviet Science Fiction.* New York: Holt, Rinehart and Winston.
- Hollister, B. 1974. *Another Tomorrow: A Science Fiction Anthology.* Dayton, Ohio: Pflaum Publishers.
- Nicholls, Peter. 1979. *The Science Fiction Encyclopedia.* New York: Doubleday/Dolphin.

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5. Readers discuss the futures perspectives revealed in the novel.

6. Identify choices and decisions for individuals, groups, and organizations that grow out of the discussion.

Possible Applications

Fictional futures literature can be a prelude to specific future planning activities; a way of stretching the imagination of those who are involved. Study circles can be organized among people who already read fictional futures literature, thereby adding an educational reflection and discussion dimension to their reading. Fictional futures literature may well provide a bridge between the generations. 4-H youth may find that they can discuss with their elders, on an equal basis, their reactions to what they have read in common. Groups of 4-H youth can be encouraged to read and share science fiction together, or provide a community service by reading to older persons. Some 4-H programs have emphasized drama, and futures fiction stories can be used as a basis of drama productions or readings. Extension newsletters could provide an updated listing of fictional futures materials.

Futures-Oriented Games and Simulations

Games and simulations have become commonplace over the past several decades. However, gaming was a popular technique for war exercises as far back as the eighteenth century. These military games were used to analyze and create possible real war situations. Since World War II, military gaming has become increasingly sophisticated and has become an important policymaking consideration (Duke, 1978).

Gaming for social science or educational purposes, however, emerged only during the early 1960s. Initially, there was confusion about its application and usefulness in the social realm. Today, games or simulations are used to build theory, to conduct research, and to provide learning experiences (McLean, 1978). We are concerned here with games and simula-

Fictional Futures Example Situations

A Cooperative Extension committee has been organized at the state level to identify ethical issues related to the involvement of Extension in new applications of biotechnology. The committee chairperson provides the members of the committee with a list of fictional futures novels to help them think about the human and scientific interactions of specific biotechnology applications.

A planning committee for a conference on the future of the family wants to stimulate its creativity on approaches to conference themes and possible major topics. Several fictional futures works that provide gender role reversals and new approaches to family division of labor are suggested as background reading.

A group of 4-Hers has been thinking about what life will be like when they grow up. They wonder about what work will be like; what kind of houses they will live in; and what transportation they will use. Their leader suggests that they read some fictional futures literature to get images of how they want the world of the future to be.

A 4-H drama group is considering ideas for their next production. The youth are asked to think of dramatic situations that were suggested in their reading of futures fiction stories.

tions that can provide anticipatory learning for Extension's professionals and their publics.

Educational Use of Games and Simulation Exercises

Games and simulation exercises can be used as educational techniques to help people adopt a futures perspective and to assist in overcoming resistance to viewing the future. Purposes of games and simulations for viewing the future are to:

- Present alternative images of the future and help people to understand the decisions that can produce desirable realities;
- Motivate learners, and prepare them for possible future experiences;
- Assist learners in their discovery of the interrelationships among variables that influence the future;
- Enable learners to experience an activity that increases their awareness of possible futures;
- Stimulate learners' thought processes and logical reasoning regarding the future;
- Provide a sophisticated, interactive communication process about what could happen;
- Provide learners with an opportunity to create a multidimensional perspective of a given future situation;
- Enable learners to approach complex tasks from their own perspective in order to observe consequences in a fictional game situation;
- Offer learners an opportunity to experiment in a basically safe environment;
- Provide learners with a simulation bridge between their present experience and the potential of the future;
- Provide feedback to learners regarding the consequences of their choices;
- Enlarge learners' perceptions, overviews, and holistic visions; and
- Demonstrate to learners alternative strategies for creating a desirable future.

For futures games and simulations to be explicitly educational, it is important for learners to know the educational purposes at the outset. After playing the game or simulation, the leader should elicit from the participants the implications that the experience has for their present decisions.

Procedures

The procedural steps for future–oriented games and simulations are the following:

- Set educational goals for the use of games and simulations.
- Select games that relate to the goals; use the information sources provided in TIP Sheet 3 (Instructional Aids).
- Explain the educational objectives to participants so that they keep them in mind during the entire activity.
- Facilitate the game or simulation; interpret the rules and operations, if necessary.
- Encourage dialogue on the choices and issues that the game brings out.
- Identify the choices for individuals, groups, and organizations that participants consider important as a result of playing the game.

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Sources of Information on Games and Simulations

Barney, Gerald O., and Sheryl Wilkins. 1986. *Managing a Nation: The Software Source Book.* Arlington, Va.: Global Studies Center.

Horn, Robert E. (ed.). 1977. *The Guide to Simulation Games for Education.* 3rd ed. Cranford, N.J.: Didactic Systems.

Journal of Simulation and Games. ca. 1970. Beverly Hills, Calif.: Sage Publications, Inc.

Examples of Future-Oriented Games and Simulations

The following list is a beginning for appreciating the programming possibilities of games or simulations. All are board games.

Balance. Interact, P.O. Box 997, Lakeside, Calif. 92040. Participants are members of four families, each living in a city with serious ecological problems. Each family completes a Family Decision Form to balance short-range hedonistic goals with long-range environmental goals.

Cope. Interact, P.O. Box 997, Lakeside, Calif. 92040. Participants become residents of Technopolis, a city of the future, and live through future time periods from 2000–2040 A.D.

Dialogues on What Could Be. The Future Associates, P.O. Box 912, Shawnee Mission, Kansas 66201.

Ecopolis. Interact, P.O. Box 997, Lakeside, Calif. 92040. Participants are residents of Ecopolis, and must work together to solve ecological problems confronting the city.

Explosion. Interact, P.O. Box 997, Lakeside, Calif. 92040. Participants are residents of an overpopulated world, and must work together to solve shortages of resources and food.

Futura City. Newsweek Education Department, 444 Madison Ave., N.Y. 10022.

Future Decisions: The I.Q. Game. SAGA Publications, 4833 Greentree Rd., Lebanon, Ohio 45036.

Futures Planning Maps. Greenhaven Press, Box 831, Anoka, Maine 55303.

The Game of Future Shock. James Adams. 8443 Brett Lane, Columbia, Md. 21045.

Global Futures Game. Earthrise, P.O. Box 120, Annex Station, Providence, R.I. 02901.

Ground Zero. Interact, P.O. Box 997, Lakeside, Calif. 92040. Explores the consequences of nuclear war in your community. Participants role-play political positions that local community leaders may take concerning civil defense, nuclear armament, and U.S. nuclear war policy.

continued

The Hopes and Fears Switchboard. DCM Associates, 908 Fox Plaza, San Francisco, Calif. 94102.

The Hybrid-Delphi Game. Jerome Saroff, Chairman, Urban and Regional Studies, University of Wisconsin–Oshkosh, Oshkosh, Wis. 54901.

The Life-Styles Games. The World Futures Society Bookstore, 4916 St. Elmo Ave., Bethesda, Md. 20814.

Simulation: Public Education in Natural Resource Management. National Resources Education Project, 127 Gaines Hall, Montana State University, Bozeman 59717.

Space Future and Other Cooperative Games. Family Pastimes, R.R. 4, Perth, Ontario, Canada K7A 3C6.

Survival. Interact, P.O. Box 997, Lakeside, Calif. 92040. This simulation examines the best resources for human survival. The focus is on four major energy sources, special-interest groups, environmentalists, and consumers. The participants set up a legislative hearing to devise the best possible energy laws.

Utopia. Interact, P.O. Box 997, Lakeside, Calif. 92040. Participants in this simulation construct an ideal society and vote on the principles that guide their new society.

The Utopia Game. Ken Davis, Department of English, University of Kentucky, Lexington, Ky. 40506. Provides the framework for an extended workshop or course in which participants invent alternative futures. They read problem-area literature and utopian fiction; draw input cards; create scenarios; and organize a political campaign related to utopia-thinking.

The World Game. University City Science Center, 3508 Market Street, 214, Philadelphia, Penn. 19104.

Microcomputer Future-Oriented Games

The following examples are evidence that microcomputer software for future-oriented games is increasing. Some of these games help teach a regional, national, and occasionally a global perspective on the economy, energy, and the environment.

Energy and Environment. Compress, P.O. Box 102, Wentworth, N.H. 03282. Teaches basic information about national and global aspects of energy growth and the associated environmental implications. Operates on Apple II or Apple II Plus.

International Futures Simulation (IFS). Conduit, University of Iowa, Oakdale Campus, Iowa City 52242. Teaches global development in population, economics, agriculture, and energy through the year 2030. Operates on IBM PC/XT/PC jr; DOS 2.10, 192K, one-disk drive, color graphics card.

Market. Essex County Educational Services Division, 715 Park Ave., East Orange, N.J. 07017. Simulates two or more companies competing for the market for a particular product (bicycles). Operates on Apple II or II Plus.

continued

Monarch. Dynacomp, 1427 Monroe Ave., Rochester, N.Y. 14618. Simulates the budgetary and resource decisions that the government of a small country must make to keep the citizens happy. Operates on Atari and Atari Basic.

Pollute. Essex County Educational Services Division, 715 Park Ave., East Orange, N.J. 07017. Examines the impact of various scientific and economic decisions on water pollution. Operates on Apple II or II Plus.

Simulation: Public Education in Natural Resource Management. Natural Resources Education Project, 127 Gaines Hall, Montana State University, Bozeman 59717. Simulates natural resource decisions on grazing lands, energy-environment, water resources, and home energy. Operates on electrical power grid units from small single-suitcase portable units or large exhibit units.

Streets of the City. Creative Computing, 39 E. Hanover Ave., Morris Plains, N.J. Simulates the political, administrative, and technical challenges involved in completing a 10-year plan of street and transit improvements, while retaining the support of a majority of the City Commission. Modeled on Grand Rapids, Michigan. Operates on Apple II Plus, Applesoft, or Atari.

Three-Mile Island. Muse Software, Inc., Charles St., Baltimore, Md. 21201. Shows the functions of the major components of a nuclear power reactor and some of the factors involved in operating a reactor. Operates on Apple II or Apple II Plus.

Games and simulations are activities that can bring together 4-Hers and adults. In New York, games have been a popular activity for the annual statewide 4-H Congress. The *Newtown Game* involved 50 to 75 youth in concurrent games and the *Global Futures Game* (Buckminster Fuller Foundation) used the world's largest map (size of a gym floor) to involve 400 participants. In both cases, youth learned to see the relationships between decisions and the distribution of resources as these affect the outcome of a city or the earth.

Games and Simulations Example Situations

The county fair provides a good situation for conducting education on energy decisions. The planning committee is looking for a future-oriented computer game that can be used as part of its natural resources display.

Extension educators from the local government 4-H Intern Program are looking for some new ways to prepare youth for their internships. They have asked if there are any games or simulations that can orient youth to future issues that local governments are likely to face. The staff is considering some of the games on land-use and environmental issues for cities.

The planning committee for the annual 4-H Youth Congress wants to introduce the youth to a worldwide perspective on the use of the world's resources. They need a game that 300–400 youth can play, simultaneously, that will involve them for at least 3 1/2 hours. Someone suggests that they use the *Global Futures Game.*

Summary: Anticipatory Learning

We all recognize that many persons, organizations, and communities resist viewing the future. Public interest in the future is fickle, subject to political ideology and cultural fluctuations. The techniques introduced in Unit I are for the purpose of overcoming this resistance. Most persons do not have an overview of the futures literature. Fictional futures literature is widely read, but usually for entertainment rather than education. Visual media hold a great deal of promise in assisting persons to overcome their resistance to viewing the future. Games and simulations also are a promising medium. Many of these techniques could be combined with a variety of other learning methods and traditional programming activities.

Anticipatory learning experiences may be required on the part of some of Extension's publics as a prelude to the use of the other techniques described in this Module.

Unit III. Projection and Forecasting

Forecasting has become essential to the modern industrialized world. Since most enterprises are helped by reducing uncertainty about the future, governments and businesses spend millions of dollars generating great quantities of information to obtain forecasts. This short introduction to projection and forecasting will not prepare us, as Extension educators, to conduct complex forecasts; rather, it will provide us with an overview; acquaint us with the work of consultants or experts; and direct us to sources of information that can be used for Extension programming or with Extension's publics. In addition, several less complex techniques are described briefly. But first, let us consider a short overview.

Overview of Projection and Forecasting Techniques

Ever since Joseph forecast seven long years of prosperity and seven long years of famine for the ancient pharaoh (and was rewarded for doing so), many have attempted to equal his accomplishment. Projection and forecasting techniques are efforts to identify and estimate the probabilities of various events that may take place in the future. They are intended to reduce uncertainty and to help us make informed decisions (Armstrong, 1978; Bell, 1973).

Today, our tools are more sophisticated than dreams and visions, and we now recognize the complexity and interdependency of forces. However, the stakes for the future of our planet also are much higher. To make good projections and forecasts, we need to be better students of human history and to use the emerging technology of computers for anticipating economic, environmental, and social change from the local to the global scale.

Obviously, forecasting can provide benefits to humankind, and can help us take advantage of opportunities and avoid disasters. Economic forecasting is important to business, industry, and agriculture (Silk and Curley, 1970; Butler et al., 1974). Social forecasting is important to those who provide health, education, transportation, and social services (Duncan, 1973; Collazo et al. 1977). Technological forecasting is important for the work force and career choices of individuals (Connors, 1978; Martino, 1978; Boroush et al., 1980). Communities find it important to project economic, social, and cultural growth or decline so they can make policy decisions (Jones and Twiss, 1978). Families are learning to appreciate the stages of family development and the changes that these bring, so that they can prepare more adequately for the future. Individuals can take advantage of the future, if they understand how probable trends may affect them. Political forecasting is important to those concerned with the promotion of peace and the prevention of war.

All projections and forecasts are based on two major assumptions. The first assumption is that there are known regularities, patterns, and cycles in the events we are forecasting. The second is that the rate or amount of change in what we are studying can be discerned from careful attention to past records and experiences, and then compared to present observable indicators; or, that we can make estimates based on known causality. In short, forecasting begins with our knowledge of the past or present and extends this knowledge, by inference, into the future. The important aspects of forecasting are identification of historical precedent; established regularities or theories; appropriate leading indicators; and quality information from which implications, trends, and projections into the future can be made (Padburg, 1972; Armstrong, 1978; Ascher, 1978; Lerenbach and Cleary, 1981).

Let us think of several examples. If we know that building contracts have already been signed, we can forecast construction expenditures. If we know that a new factory will be built, we can reasonably forecast demands for new housing. If we know something about the projected labor force we can take into consideration whether employees will be drawn from the locale or will be attracted from outside the area. A falling barometer forecasts a change of weather, since barometric pressure has been established as a fairly reliable indicator. A rising birth rate is traditionally an indicator that schools will face overcrowding when these new babies reach school age.

Projections based on theories about physical, economic, or social regularities are, of course, only as reliable as the strength of each theory. It is obviously easier, in most cases, to forecast the near future than the distant future, and physical or natural world events more accurately than events that are affected by peoples' choices. Several observations can be made regarding the limitations of forecasting techniques.

Limitations of Forecasting Techniques

Forecasting techniques often are subject to certain limitations. Among these limitations are:

- Forecasts of physical events, such as the positions of comets based on theories, are more accurate than forecasts of human social behavior. This is because regularities in social behavior are less well established, and the related theories, therefore, are less reliable than those that explain physical phenomena.

- Selecting significant variables or indicators is critical. If the correct indicator is omitted, all the forecasting effort could be in vain.

- Extrapolations for trends work best for short-term forecasting. Extrapolations are mathematical estimates that carry on after the data stop. The farther into the future they are projected, the more uncertainty there is about the influence of other factors.

- Computers can help by handling large data files, but they do not tell us what variables to include or what analyses to use. To omit important information, or to run faulty analyses, will result in faulty interpretations: people do the thinking.

- Complex techniques may be impressive, but are not necessarily related to accuracy of forecasts. Watch out for ''rainmaker showmanship'' in consultants. Paying for a complicated show that has little to do with forecasting what we want to know can be wasteful.

Data Profiles

American Demographics. New York: Dow Jones and Company, Inc. Published monthly.

Annual Report. Washington, D.C.: Resources for the Future Foundation. Published yearly.

Business Condition's Digest. Washington, D.C.: Bureau of Economic Analysis, U.S. Department of Commerce. Published monthly.

Center for Futures Research Newsletter. Los Angeles, Calif.: Center for Futures Research, University of Southern California. Published bimonthly.

Futures: The Journal of Forecasting and Planning. I P C Press, 32 High Street, Guildford, Surrey, England: GU1 3EW. Published bimonthly.

continued

The Futurist. Washington, D.C.: The World Future Society. Published bimonthly.

Journal of Forecasting. New York: Wiley Interscience Publication, John Wiley and Sons. Published monthly.

Long-Range Planning. Elmsford, N.Y.: Pergamon Press. Published bimonthly.

Planning Review. New York: Crane, Russak and Company. Published quarterly.

Social Indicators Newsletter. Washington, D.C.: Center for Coordination of Research on Social Science Indicators, Social Science Research Council. Published quarterly.

TA/Update. Washington, D.C.: International Society for Technology Assessment. Published quarterly.

Technological Forecasting and Social Change. New York: American Elsevier Company. Published quarterly.

United States (also most other countries of the world). Paris: Organization for Economic Cooperation and Development. Published yearly.

World Economic Outlook. Washington, D.C.: International Monetary Fund. Published yearly.

World Future Society Bulletin. Washington, D.C.: The World Future Society. Published bimonthly.

World Resources 1986. International Institute for Environment and Development, World Resources Institute. Published yearly.

Most university librarians can assist in locating these and other books and periodicals that contain data to aid forecasting. In addition, state government units; chambers of commerce; and public libraries, through their interlibrary loan services, can provide access to relevant data for making projections and forecasts.

When we learn about tools, we usually want to know what they do and how to use them. Before discussing specific techniques for forecasting, we will describe a general process for forecasting, one within which various forecasting techniques can play a part.

Activity Sequence for the Use of Forecasting

Persons, families, groups, or organizations that use forecasting techniques will typically engage in the following six steps, whether or not they are called by these names:

1. *Establish our priorities and concerns.* Pose questions about what we want to know, and why we want to know it.

2. *Identify the relevant events or forces* that are likely to shape what will happen in the future. This is the key step, and the point at which errors usually occur in making forecasts. If we omit the most important force, we will get false results.

3. *Identify the indicators of change* that are related to our priorities and concerns. Collect information about the performance of these indicators.

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4. *Forecast each priority or concern,* taking into consideration the relevant forces and directions of indicators. This is where we use an appropriate forecasting technique to estimate, or project, what we think will happen.

5. *Draw implications* from the forecasts. During this activity we identify the choices that we have available to us. We ask ourselves what we can or cannot do about the projected situation.

6. *Devise strategies.* Determine what we can do immediately, and what can be done in stages, to implement our choices.

Access to Relevant Data

Since most Extension personnel will not have the time or expertise to conduct forecasts on their own, access to resources becomes important. Institutions of the land-grant system are the primary resources for data files than can be used for forecasting. These institutions also have faculty members who are familiar with most of the forecasting techniques. These faculty members can be found in departments or schools of business administration, agricultural economics, education, sociology, medicine, engineering, natural resources, and government, to name a few. Most of the institutions also have access to census data files, which have projections to the next decade on many items. Some state Extension services provide assistance in the use of these data sources. The following periodicals and books contain data profiles for numerous indicators and should be available through most university libraries.

An Overview of Futures Research Centers

Futures research centers historically have contributed to the development of forecasting methodologies. Extension educators or their publics may be able to use such centers for specific situations, if they are nearby and resources are available. A brief history of the development of futures research centers follows.

It was the multibillion-dollar U.S. concern with national defense at the end of World War II that led to the formation of the Rand Corporation as a think tank. This move created the climate for developing the scenario and Delphi techniques of futures forecasting that are associated with the names of Herman Kahn and Olaf Helmer. A concern for world peace, through the mobilization of responsible scientists and intellectuals, led to the formation, with Ford Foundation money, of the Futuribles group of Bertrand de Jouvenel in France. In the U.S., a similar desire to focus the expertise of a wide range of scholars on problems of the future prompted the formation of The Commission on the Year 2000, headed by Daniel Bell. A fourth notable development was the arousing of world industrial leadership by Aurelio Peccei and Alexander King, who, through The Club of Rome, sponsored two well-publicized, computer-based studies. A few other centers have come into being, including Willis Harman's group at Stanford Research Institute. When Kahn left Rand to form The Hudson Institute, Helmer left to co-found The Institute for the Future. Later, Helmer became associated with The Center for Futures Research at the University of Southern California, Los Angeles (Loye, 1978). Futures research centers flourished in the 1970s, but struggled to stay alive during the 1980s. Only a few politically conservative think tanks have been established in the past decade. Their future role is uncertain. However, centers should not be ignored as a possible resource for Extension and its publics.

Techniques for Projection and Forecasting

Many techniques that aid projection and forecasting are described in the literature. The oldest and perhaps still the most useful technique is that of locating historical precedents and making com-

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parisons to one's present situation. Another common technique for projection and forecasting is the Delphi process, which is based on successive rounds of inquiry among experts, drawing from them their consensus regarding trends. Trend extrapolation, another technique, usually is accomplished by comparing changes in indicators over several points in time, and then projecting into the future. Although most trend extrapolations are the result of quantitative analysis, a few use qualitative (number-free) methods. The book, *Megatrends* (Naisbitt, 1982), is based on a qualitative analysis of thematic material in periodicals and newspapers. Naisbitt makes the assumption that cumulative reporting of events or topics in the popular media constitutes a trend. Another approach, cross-impact analysis, provides a way to estimate the extent to which two or more forces or events may influence each other. There are many other approaches to projections and forecasting, such as computer modeling, that are beyond the scope of this Module. Brief descriptions of the historical precedents, Delphi, trend extrapolation, cross-impact analysis, and the use of computers and their limitations in forecasting follow.

Historical Precedents

As noted earlier, the oldest and perhaps most useful technique for projection and forecasting is that of locating historical precedents and making comparisons to one's present situation. For instance, a traditionally rural community that is facing expansion through construction of a new industrial plant or military base would not be well informed by forecasting from its own past economic and social indicators. Rather, local planners would seek to locate case histories of communities that have experienced similar growth and change from a solely agricultural economic base.

Delphi Analysis

Overview of Delphi Analysis. The island of Delphi was the hallowed site of the most revered oracle in ancient Greece. Legend has it that Apollo was the master of Delphi: the god who was famous throughout Greece for his ability to foresee the future. Those who consulted the oracle brought gifts, thereby making Delphi one of the richest and most influential locales in Greece. During the 1950s, the Rand Corporation adopted the fortuitous name for an analytic procedure that was developed by Helmer and Dalkey to assess expert opinion about the targeting of nuclear weapons. The procedure was published in 1964, and since then has become a well-recognized futures research technique (Enzer, 1973; Linstone and Turoff; Sackman, 1975).

Originally, the Delphi procedure was designed to solicit expert opinion on a particular subject through a very structured communication process. In this process a monitoring team was identified. This team was responsible for defining the problem, setting goals and objectives, and constructing a questionnaire to stimulate the subsequent Delphi process. Through a series of "rounds," the experts were asked to expound upon a particular matter; respond to other experts' replies; and redefine their own positions. Ultimately, their opinions were to converge or fall into agreement. Anonymity was maintained throughout the process.

Today, there are a number of versions of this technique that can be used by both laymen and experts. The purposes have multiplied. The Delphi process can be used to gather expert opinion for long-range forecasting. It also can be used to obtain expert opinion regarding the probability that certain events will or will not occur, and the nature of relationships among events. In addition, it can be used to create scenarios; forecast the effects of technology; or interpret trend extrapolation data. Both convergent and divergent responses can be obtained. In fact, one version of Delphi deliberately identifies multiple options, and explores the advantages and disadvantages of particular policy alternatives. In subsequent units of this Module, we will mention Delphi as a technique for prevention and adaptation or invention and creation purposes for viewing the future. Delphi studies have been conducted on coastal zone land use, biological danger, potential loss of income, commodity trends, human services trends, and energy sources, to name a few topics.

The Delphi process has some advantages over asking participants to deliberate together on a committee. For one thing, respondents do not need to be brought together in one place. By using the Delphi, a committee also can avoid (1) the domination of one expert over the others; (2) the hesitancy of individuals to take a position before all the facts are in or before they know which way the majority is headed; (3) the difficulty of publicly contradicting individuals in higher positions; (4) unwillingness to abandon a position once it is publicly taken; and (5) the fear of bringing up an idea that might turn out to be unacceptable and might result in a loss of face.

The quality and accuracy of responses to a Delphi are obviously only as good as the expert quality of the participants who became involved in the process. The questionaires must be carefully constructed, and the rounds must be orchestrated with a clear purpose in mind (Linstone, 1978).

Procedures for Delphi. Although the procedures for Delphi may vary somewhat, the following steps are quite common (Linstone, 1978). These steps can form a core for many variations.

1. Formation of a team to undertake and monitor a Delphi on a given subject.

2. Selection of one or more panels to participate in the exercise. Customarily, the panelists are experts in the area to be investigated. However, lay persons with a vested interest in the topic also are frequently included.

3. Development of the first-round Delphi questionnaire.

4. Testing of the questionnaire for proper wording (e.g., ambiguities, vagueness).

5. Transmission of the first questionnaires to the panelists.

6. Analysis of the first-round responses.

7. Preparation of the second-round questionnaire (and possible testing).

8. Transmission of the second-round questionnaires to the panelists.

9. Analysis of second-round responses. (Repeat questionnaires and analyses as long as desired, or as necessary to achieve stability in the results).

10. Preparation of a report by the analysis team to present the conclusions of the exercise.

Whenever the judgments of experts may be helpful, Delphi analysis should be considered as a vehicle for systematically gathering, analyzing, and synthesizing expert judgments regarding what may happen; what is desirable; and what are alternative ways of creating a desirable future.

Trend Extrapolation

Generally, Extension educators will conduct their own trend extrapolations only if they use computers with packaged programs. However, the land-grant institution is a major resource for packaged programs, since it houses many program specialists who have access to specific data sources. Most land-grant institutions also have mainframe computers that can handle large volumes of data.

Most forecasts or projections are made by using quantitative data in the form of repeated measurements that are compared across time and extended into the future. Trend extrapolation looks for a tendency for the values in a time series to

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increase or decrease with steady regularity. For example, we can plot the population of a county in the U.S. during each census year. The data will show, in most cases, a steady trend with each successive set of census figures. There are a number of methods, of varying sophistication, for trend forecasting. The steps

Delphi Example Situations

A statewide Extension committee on vegetable crops, composed of field staff and faculty members, has decided to consider the future direction of its research and Extension efforts. The members identify several experts for each crop and conduct Delphi studies to project judgments regarding the market potential for each crop, and the potential for crop improvement through research.

In the aftermath of a severe flood that affected six counties, a committee appointed by the county governments has been set up to consider what could be done to put in place an early warning system for flood disaster. The Extension office in each county has been asked to appoint a person to serve on the committee. One of the appointees suggests that a Delphi process could assist the committee in determining the nature of effective early warning systems.

Members of a home-owners association have just discovered that there are no civil defense plans for their city in the event of a major earthquake. A recent earthquake 300 miles from their city caused considerable damage. They fear that the same intensity could bring real loss of life to their city. They wonder if it is worth thinking about such plans, and what the experience of other cities has been. A county Extension agent, as a member of the home-owners association, attended the meeting and suggested the use of the Delphi technique to analyze the possibilities of what they should do. The group identifies experts in six cities that have undergone earthquakes.

The president of a land-grant institution has appointed a task force to clarify the mission and goals of the institution for the next 10 years. The Cooperative Extension System is represented on the task force. The Delphi approach has been suggested as a way to involve a number of professors who study the trends in higher education from different colleges of education at other institutions. The task force is hoping that this panel of experts will provide a consensus of events that could most likely affect land-grant institutions.

The board of trustees of a large urban community hospital has decided that it should consider long-term alternatives for the hospital. It has appointed a committe of the board to design an approach for projecting the effects of different policy decisions that the board could make. A member of the appointed committee has asked an Extension educator for help in designing the process. A Delphi process is being undertaken with seven hospital administrators. These administrators are being asked to identify alternative fiscal policies, and to make projections for the outcomes of these policies on hospitals of various types.

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of the simplest, most common approach, which involves the inspection of the trend data and then plotting a projection into the future, will be described in this unit. Trend extrapolation can provide useful forecasts to some of our basic questions (Hill, 1978).

Some Advantages of Trend Extrapolation. Among the advantages of using trend extrapolation, the following are perhaps the more important:

1. Trend extrapolation techniques are relatively easy to execute when compared to other complex techniques used for forecasting the future. This is particularly true when data on a single variable are available for several points in time.

2. Trend extrapolation is cost effective, time efficient, and systematic when data are already available.

3. Trend extrapolation, if used as a first choice in forecasting, forces you to learn more about the history of your subject. This knowledge can provide valuable insights on the extent or regularity of possible future events that might not otherwise be acquired.

4. Trend extrapolation can provide credible projections for events that are subject to regularity. When projections are difficult to interpret, you should probably recognize that what you are projecting may not be something that can be interpreted as a trend. Rather it may be something that is subject to unpredictable factors or events, such as droughts, epidemics, or political decisions.

Steps Involved in Trend Extrapolation:

1. Establish the problem of concern and then identify specific indicators that can be reported numerically.

2. Acquire data, on each indicator, for several points in time.

3. Plot the data points for each time period on a graph.

4. Analyze the trend by projecting the line on the graph into a future time period, while taking into consideration the overall pattern of the line.

Some Key Considerations in the Use of Trend Extrapolation. Among key considerations to explore when using trend extrapolation in forecasting and projecting a trend are:

1. In using trend extrapolation in forecasting, the time period is a crucial consideration. A relatively long-time series is needed to "capture a trend." However, the decision about how long a time period to incorporate is largely contingent upon the nature of the problem under study. A general rule is to acquire and plot data over as long a time period as possible, within the limitations of comparable and reliable historical data.

2. When projecting the trend, look for three different potential patterns in the data. Recognizing a specific pattern will increase the accuracy of projections. The potential patterns are:

(a) *Seasonality:* the tendency for figures to show regular fluctuations, due to seasonal effects. For example, retail sales peak during the Christmas period, so figures from December would give an unreliable projection for January.

(b) *Cyclical factor:* "cycles" refer to the brief, successive periods of fluctuations, either peak or low, that occur in the overall trend line. For example, housing starts often show cycles of increase and decrease within an overall growth trend.

(c) *Irregular shocks:* refers to points on the historical time line that do not show a pattern. When interpreting these shocks, we should ask if these changes could be due to unique events that may not apply to our projection. For example, wars and economic recessions produce irregular shocks in birth-rate trends, and we should consider these shocks in projecting school building needs.

Trend Extrapolation Example Situations

A poultry producers' association has members who think that turkey production might be profitable in the next 10 years. They want Extension to help them make some projections about turkey market trends.

Extension specialists in departments that "back-stop" the work of Extension field staff have been asked by their State Extension Director to prepare short statements on trends in their areas of specializations that are likely to affect Extension's publics over the next 10 years. The statements are to be submitted within one month so they can be used by Extension field staff in creating their plans of work.

The Child Care Council is proposing to undertake a study of the future of child-care services in the county. An issue is the future of center day care versus family day care. The council is concerned about the demographic trends and their implications for child care. An Extension home economist, who is a member of the council, has been asked to design the study. Extrapolation from census data and from the council's records is being considered.

An Extension home economist has recognized from census data that an increasing number of persons will be approaching retirement age in her county. She wonders if there is a need for programs that emphasize preretirement planning and how she could get this population to think about their personal futures before their retirement.

The demographic forecasts of census data for several counties show an aging population and a declining youth population. The 4-H Extension educators in these counties are concerned about what the future of 4-H in their counties will look like in 10 years. They have decided to address this topic at their next Extension 4-H agent professional

Microcomputer Programs for Trend Extrapolation

A number of microcomputer programs have been written for trend extrapolation. The following are examples.

Farm Weather Center. Climate Assessment Technology, Inc., 11550 Fuqua, Suite 525, Houston, Tex. 77034. Helps forecast corn, soybean, or spring wheat crop development to maturity, based on soil properties and daily weather. Operates on IBM PC/XT/AT or compatible; DOS 2.0 or higher.

Rapid. Futures Group, 1029 Vermont Ave. NW, Washington, D.C. 20005. Prepares and presents analysis of how population factors affect a country's chance of attaining its stated economic and social goals. Operates on IBM PC or Apple II, II Plus, IIc.

Tracker. Argos Software, 1485 West Shaw Ave., Fresno, Calif. 93711. Provides a convenient means of recording information on everything that is done to a piece or pieces of farmland, and provides a display of resultant trends as a basis for farm management decisions. Operates on IBM PC/XT/AT; floppy disk: 256K memory.

Twigs. North Central Forest Experiment Station, 1992 Folwell Ave., St. Paul, Minn. 55108. Projects the growth of individual trees or groups of trees; estimates saw timber and cordwood volumes; and provides a wide variety of cutting and thinning options to simulate forest management practices. Operates on IBM PC/XT/AT or compatible.

When to Use Trend Extrapolation. Some suggestions on the use of trend extrapolation follow:

1. Trend extrapolation should be used only if the required data are accessible. The nonavailability of data proves to be a major constraint in projecting the answers to many questions.

2. Trend extrapolation, because of its relative ease of application, probably should be considered as a ''baseline methodology'' for most forecasting problems. After a trend exercise has been conducted, Extension educators or their publics can judge whether further, more sophisticated analysis by experts is warranted.

3. Trend extrapolation should be used in combination with other techniques. When used alone, Delphi findings may be misleading due to limitations of data, the failure to acknowledge irregular shock, and the possibility that novel, unanticipated factors may be at work. We recommend using trend extrapolation in combination with Delphi, cross impact analysis, and creation or invention methods.

Cross-Impact Analysis

There is nothing new about considering the relationships between two or more potential events. However, only recently have more formal approaches to estimating probability and potential relationships been brought to bear on situations in which there is uncertainty regarding the outcomes of two or more anticipated, interacting events.

History of Cross-Impact Analysis. The cross-impact concept was developed by Olaf Helmer and Theodore Gordon while designing a forecasting game for Kaiser Aluminum in 1966. In 1968, T.J. Gordan and H. Hayward, while at the University of California, Los Angeles, developed a computer-based approach to the use of cross-impact analysis. However, the computer approach is complex and beyond the scope of this Module so we will limit ourselves to a description of the basic idea. The concept behind a cross-impact analysis has many valuable applications to situations common to Extension's publics. Events rarely occur in isolation. For example, a change in government agricultural policy may need to be considered in relationship to changing markets or increased transportation costs.

What Is Cross-Impact Analysis? Cross-impact analysis is a technique for examining and estimating the interaction among two or more future events. The intent of the analysis is to identify aspects or effects that will either aid or hinder the occurrence of the other events.

Cross-impact analysis is used to estimate the strength of cause-and-effect relationships, by constructing a matrix of major events relevant to the problem being examined. Cross-impact analysis estimates the conditional probability of an event occurring, given that various other events have or have not occurred (Harrell, 1976; Stover and Gordon, 1978).

Cross-impact analysis is based on the premise that societal events do not occur in isolation but are, in some way, connected to or affected by other events and developments. The method usually is used in conjunction with the Delphi technique, because, in most cases, expert opinion is used to determine the probability of an event.

Advantages of Using Cross-Impact Analysis. Among the advantages that accrue from using cross-impact analysis in examining and estimating the interaction between two or more future events are:

1. Cross-impact analysis enables us to make points clearly. The events and the associated probabilities are shown graphically in the form of a matrix, which provides a visual medium for the arguments presented.

2. Cross-impact analysis yields unfolding and emergent information. That is, the events relevant to the problem at hand

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trigger additional thinking about other possible events that might be included in the analysis.

3. Cross-impact analysis allows for integration of expert opinion in the analysis, on its own or in combination with other techniques, such as the Delphi method.

4. A cross-impact analysis matrix can be used as a means for thinking through possible effects of proposed policies. Each cell in the matrix shows the expected outcome of different decisions.

5. Cross-impact analysis may provide additional information over and above its specific purpose of estimating potential interactions among two or more events. The completed matrices should be examined closely, because you might perceive that some estimated effects may have a cumulative effect on the total system. When a cumulative effect is perceived, specific actions that are critical and strategically influential can be taken.

6. Cross-impact analysis has been useful in marketing and production questions, foreign policy issues, institutional goals, communications, natural resources, defense, ecology, education, and many other areas. By reducing uncertainty and pointing to areas of critical action, cross-impact analysis can play a key role in decisionmaking.

Procedures for Cross-Impact Analysis. The cross-impact analysis method described here does not require mathematical calculations. Rather, it is a procedure for securing and then displaying probability estimates in such a way that they can help to answer three questions: Is the event likely to happen? Does the happening of one event make another event more or less likely? Is the likelihood great enough to justify action now? Here is an example of how the procedures work. The situation and the probabilities shown are artificial.

Step 1—*Select the Events.* A group of dairy producers believes that within the next five years the federal government will take positions on the use of bovine growth hormone (BGH) and on domestic milk production quotas. The producers also think that the outcome of the decision about BGH may well influence decisions on quotas—and that both have important consequences for the dairy industry. This group is seeking some way to express and examine the possibilities clearly enough to decide if they should plan action now.

Step 2—*Estimate Independent Probabilities.* The producers first talk with an animal scientist. She estimates that there is a 40 percent chance the Food and Drug Administration will approve BGH within the next five years. (Of course, this means a 60 percent chance the agency will not.) The producers next approach an agricultural economist and ask his judgment about the possibility of domestic milk production quotas. He puts the probability of such quotas being instituted at about 20 percent. The judgments collected so far, which estimate the probability of each event coming about, but do not consider the possibility that one could influence the other, can be shown as:

	Quota — Yes .20	Quota — No .80
BGH — Yes .40		
BGH — No .60		

Step 3—*Estimate Probable Influences.* The dairy producers now approach a number of agricultural economists and dairy scientists with new questions: If BGH is approved within the next five years, what is the probability that production quotas subsequently will be instituted? Would BGH approval increase or decrease the chances of quotas? Since estimates of chains of events are more tenuous than estimates of single events, the producers seek judgments from a number of experts. They take all of these judgments and average them to get a probability estimate that is assumed to be more accurate than a single estimate would be. The producers also note two things: the experts are unanimous in their belief that approval of BGH would increase the chances of a quota, and most of the probability estimates were close to one another. The latter observation makes the producers more confident that there is professional agreement about the issue.

	Quota — Yes .20	Quota — No .80
BGH — Yes .40	.32 (↑)	.68 (↓)
BGH — No .60	.16 (↓)	.84 (↑)

Step 4—*Summarize Estimates.* The producers display their study results on a matrix, using an arrow (↑) to show cases in which the BGH decision would increase the chance of quota approval and an arrow (↓) to show cases in which the BGH decision would decrease the probability of milk production quotas.

Step 5—*Interpret the Findings.* The cross-impact analysis the producers completed not only displays a lot of information in one simple graph, but provides answers for some pertinent questions:

- Will one event likely influence the chances for another? In this case, it seems logical that BGH approval could increase the chances for dairy production quotas to be approved; the experts' estimates backed this up, as the "↑" signs show.
- What are the chances that this chain of events will come about? The producers look at the independent probabilities. The experts judge that the chances were about two out of five (40 percent) that BGH would be approved and one out of five (20 percent) that quotas would be instituted. The numbers say that the events probably will not (less than 50 percent chance) occur. The producers must use their own judgment to decide if the probabilities are great enough to warrant concern.
- Is it worth worrying over? The probabilities change when the possible influence of BGH approval is considered. If that happens, the estimates for quota approval jump from 20 percent to 32 percent. Again, deciding whether these estimates justify action is a judgment call on the producers' part.

Cross-Impact Analysis Example Situations

The Extension home economists at the County Extension office have received growing numbers of telephone requests from renters who want to know whether or not there will be income tax law changes that may effect an increase in rental costs. If so, they want to know if trying to buy housing before these possible tax changes will benefit them.

Sea Grant agents have called a meeting of planners from the towns and cities that adjoin the shoreline of an area where there has been talk about possible shoreline redevelopment efforts on the part of the Army Corps of Engineers. At the meeting, the planners want to consider the probability of the Corps of Engineers' efforts, and whether this activity will affect the possibility of part of the area being designated as a state park. The group uses a cross-impact analysis to estimate what may occur, given one or the other

Considerations in Cross-Impact Analysis. The foregoing example of a cross-impact analysis brings out several factors to keep in mind when using the procedure:

- *The numbers are not magic.* The figures that result in the matrix are not absolute probabilities that things will occur. Rather, they are estimates that let us examine the relative size of different possible outcomes. The numbers mean nothing until they are interpreted. An 80 percent probability of rain is unimportant to a student with classes that day. A 25 percent probability of rain, however, might prompt a farmer with hundreds of thousands of dollars in crops to begin harvesting.

- *The analysis works one way.* The foregoing example was based on the assumption that BGH approval would influence decisions about imposing dairy production quotas. No assumptions were made concerning the influence of BGH approval on quota decisions. That would have been another, separate analysis.

- *The analysis is as good as the logic behind it.* In using cross-impact analysis, it is crucial to select the right factors for study, and to be correct in assuming that one is a logical, probable cause of the other. It makes no sense to cross-impact analyze factors that do not break out into cause-and-effect: there would be little value in the producers' examining the relationships between BGH approval and energy cost projections (there probably is none). It also makes little sense to look at impossible (probability of zero) or inevitable (100 percent) events.

Computer Uses and Limitations

In general, projection and forecasting can be improved with the assistance of computers. Since Extension's publics are becoming more sophisticated in the use of computers, and computers are becoming more readily accessible, it is important to consider their use. In addition, the availability of computer software for micro or personal computers makes forecasting techniques attractive to many of Extension's publics. Almost all County Extension offices in the U.S. have microcomputers.

Many land-grant institutions provide access to data bases and computer models for forecasting through their mainframe computers. Often these systems are available through WATS (Wide-Area Telephone Service) lines. Some institutions even provide the services of computer information scientists who are knowledgeable in agriculture. These persons can provide consulting on what equipment is available and how to use it.

The following short list of reference guides to computer programs and information sources can be a starting point for exploring this fast-changing resource.

Reference Guides to Computer Programs

Agricultural Computing Sourcebook. (1986). Doane Publishing Company, St. Louis, Mo. 63146. Background and overview of agricultural computing, languages and programming, hardware, communications, software sources, and applications and reviews.

Agricultural Software Catalogue, (1986). Agricultural Computer Extension, Guelph Agricultural Center, Ontario Ministry of Agriculture and Food, Ontario, Canada, NI H6NI. Information on software for financial management, land economics, crop production and management, crop field care, livestock management, and forecasting decision aids.

Corey, Tom (ed.). *Doane's 1986 Agricultural Computing Directory.* Doane Publishing Company, St. Louis, Mo. 63146. Information on agricultural computing, choosing hardware, rules for software selection, on-line information services, land-grant institution resources, commercial agricultural software, and an index to software companies.

Managing a Nation: The Software Sourcebook. (1986). Global Studies Center, 1611 N. Kent Street, Suite 600, Arlington, Va. 22209. Information on currently available software that can be applied in the management of any small nation regarding the economy, rural development, energy, water, agriculture, forests, population, environment and ecology, transportation, security, politics, global models, and modeling languages.

Smith, G.D. and S.N. Smith. (1984). *Agricultural Software Directory: IBM CP/M.* Agriware Company, Wyndcrest Dr., Elmo, Maine 55020. Software information for IBM computers and computers with CP/M operating systems on agricultural business, feed, commodities, crops, machinery, livestock, and tips on selecting suitable software.

Strain, J.R., and S. Simmons. (1984). *The Cooperative Extension Service Updated Inventory of Computer Programs.* U.S. Department of Agriculture, Washington, D.C. Lists 1,770 computer programs available to land-grant institution, Extension, and other government service employees. Programs are classified by subject matter, machine used, and contact person.

Williams, M.E., and C.G. Robins. (1985). *Agricultural Databases Directory.* Bibliographies and Literature of Agriculture No. 42, National Agricultural Library, U.S. Department of Agriculture, Washington, D.C. Contains both word-oriented and numeric data bases, and a subject index.

In addition, Agricultural Computing Conferences have been held since 1980, with the help of the Association of Agricultural Computing Companies. Conferences are aimed at on-farm use of computers.

The following examples of on-line data bases can be used through most land-grant institutions:

Computer On-Line Databases

ACRES (American Farm Bureau Federation)

AGNET (University of Nebraska, Lincoln; North Dakota State University, Fargo; South Dakota State University, Brookings; and Washington State University, Pullman)

AGRIBUSINESS U.S.A.

AGRIDATA Network (AgriData Resources, Inc., Milwaukee, Wis. 53202)

GIS (Geographic Information Systems)

GRASSROOTS (Grassroots America)

NPIRS (National Pesticide Information Retrieval System)

RIC (The Rural Information Center) is an information and referal (I & R) service on questions concerning rural economic competitiveness; impacts of social, political, and economic changes; and public decisionmaking. Inquiries are answered by accessing over 300 on-line databases and all major library collections in the world. RIC is a joint project of two USDA agencies: the Extension Service and the National Agricultural Library.

TOXNET (Toxicology Data Bank and Hazardous Substances Data Bank)

USDA ON-LINE (U.S. Department of Agriculture, Washington, D.C.)

Global Modeling. In the future, it will be more important for Extension personnel and their publics to think globally and act locally. This viewpoint becomes imperative, because nations are linked inseparably to each other through trade, finances, migration, climate, rivers, pollutant flows, communication, transportation, and treaties. The future of any local area is, of course, influenced by decisions, forces, and events that take place on an international scale. Computer modeling on a global scale can help us to appreciate global influences on local events and decisions. For a decade or more, computer models have been constructed to take these global influences into consideration in projecting global scenarios. Although global modeling is in its infancy, there are several reasons why it deserves to be mentioned. First, Extension professionals should know the limitations of global modeling so that they can advise their publics against holding unrealistic expectations. Second, global modeling can contribute to our appreciation of what to consider in thinking globally, while making decisions locally. And third, the scenarios created through global modeling can focus public opinion on important high-priority issues, even if the accuracy of forecasting is limited by unforeseen events.

The following quotations provide statements of agreement and disagreement on the state of the art of computer global modeling for forecasting, according to the Sixth Symposium of the International Institute for Applied Systems Analysis, held in Laxenburg, Austria, in 1982 (Meadows, 1982).

Global Modeling—Areas of Agreement:

1. It is better to state your biases, insofar as you are able, than to pretend you do not have any.

2. Computer models of social systems should not be expected to produce precise predictions.

3. Inexact, qualitative understanding can be derived from computer models and can be very useful.

4. Methods should be selected to fit problems (or systems); problems (or systems) should not be distorted to fit methods.

5. The most important forces shaping the future are social and political and, so far, these forces are the least well represented in the models.

6. In long-term global models, environmental and resource considerations have been too much ignored.

7. Models should be tested much more thoroughly for agreement with the real world, for sensitivity to uncertainties, and over the full range of possible policies.

8. A substantial fraction of modeling resources should go to documentation.

9. Part of the model documentation should be so technically complete that any other modeling group could run and explore the model, and duplicate all published results.

10. Part of the documentation should be clear and free from jargon, so that a nontechnical audience can understand all the model's assumptions, and how these assumptions led to the model's conclusions.

11. Modelers should identify their data resources clearly, and share their data as much as possible.

12. Users, if there are any clearly identifiable ones, should be involved in the modeling process as directly and frequently as possible.

13. It is necessary to have an international clearinghouse for presenting, storing, comparing, criticizing, and publishing global models.

14. There should be many more global models.

Global Modeling— Areas of Disagreement. Among the areas of disagreement about global modeling are the following:

1. Should global models be built to answer a single, well-defined question, or should they be built to represent many aspects of a system and serve many different purposes?

2. Should global models be made in direct response to pressing issues of public policy, or should the goal be general improvement in understanding?

3. Should global models be normative or descriptive?

4. How far into the future can one see with a global model?

5. What is the best method to use for global modeling?

6. Should global models be large or small?

7. Should the procedure for developing the global model be top down or bottom up?

8. What should be done when data about a crucial system relation are not available?

9. How should actors, technology, process, population, and so on, be represented?

10. How should a global model be tested?

The Cooperative Extension System would do well to keep up to date regarding developments in forecasting capabilities that may be expanding through the use of computers at some of our land-grant institutions. Simpler techniques can be used directly with some of Extension's publics. In other cases, Extension can perform the role of resource broker for those publics who need to be put in touch with those who can perform more complex projection and forecasting tasks.

Unit IV. Prevention and Adaptation Techniques

In Unit III, which focuses on techniques for projecting and forecasting, the starting point was knowledge of past perspectives and their implications for the future. The purpose and starting point in Unit IV differs from those in Unit III. Here, a proposed course of action or event is the starting point for prevention and adaptation techniques to generate futures perspectives. A proposed course of action could be the construction of a building, or a new highway, or a change in public policy that will affect a specific population. Sometimes the event is the introduction of a new technology or treatment, or the discovery that a past event or practice may be placing people or the environment in jeopardy.

Events that require the use of prevention and adaptation techniques are those that affect the lives of a great number of people. In this way of viewing the future, the effort is focused on identifying and interpreting either potential risks, or the undesirable, hazardous, and unintended consequences of specific proposals. The assessment is intended to let us know if the innovation calls for subsequent adaptation, if proposals should be abandoned, or if we should initiate new precautions.

The systematic study of impacts from a wide variety of proposals is now known as "risk assessment." Risk assessment encompasses impacts in the area of technology, environment, and social systems. In practice, however, the distinctions that can be made among each are often blurred, since features of all may be included in a single study of a prevention and adaptation risk assessment effort.

History of Impact or Risk Assessment

Economic impact assessments have been around for a long time. They have been widely used by businesses and governments. Economic impact assessments typically include market research, cost/benefit analysis, and estimates of impacts on employment, taxes, revenues, displacement of businesses and farms, long-term productivity, cost of living, standards of living, energy requirements, and energy savings.

Impact assessments address questions such as:

- Is the proposal workable, feasible, and within budget?
- Who will use it and pay for it?
- How can demand be generated?
- What is the benefit/cost ratio?
- Which alternatives will bring the most benefits?

For many years, if the answers to these questions were positive, this meant a "green light" for the proposed technology, development project, or economic policy. However, these questions do not include a concern for areas other than the economy (Dede, 1978).

More recently, we have become concerned about the possible unintended effects of our technologies. No one seriously doubts that decades of technological innovation have played a major role in shaping the modern world. Technology has influenced living standards, geographic features, the atmosphere, and the food chain. Technological advance has been considered a source of economic, social, and cultural progress over the centuries. Increasingly, technological efficiencies have been realized in primary industries such as agriculture and mining, in the production and distribution of energy, in transportation, and in electronic and information processing.

The technological success of the western industrial and postindustrial world has created what some writers call a technological "fixation." This "fixation" is manifested in our tendency to view technology as the solution to all problems.

We seldom stop to question the appropriateness, long-term costs, or side effects of the technical means chosen. Few visions of the future do not, in some way, include and depend upon the use of technology. However, this does not mean consensus. There is a broad gap between those who propose large-scale, capital-intensive technological solutions and those who propose small-scale, appropriate technology that can be controlled by the people.

The past few decades have seen an amazing succession of alarms and controversies over technology. These controversies have been a warning to us that, in addition to economics, we must also consider the effects of technologies on the environment and human health (Lawless, 1977). Unforeseen disasters, from DDT threats to wildlife, to oil slicks and nuclear power melt-downs, have received worldwide attention. Society has become more aware of environmental dysfunctions and the indirect and delayed impacts of technology on natural resources. Frequently, these effects are both undesired and unintended. Risk assessment techniques now provide us with tools that allow us to examine the often unquestioned applications of technology and the rush toward unbridled development.

Once the door was opened to environmental impact assessment, researchers took little time to recognize that social impact assessment had been neglected. Concern for unintended, indirect, and delayed impacts of technology on individuals and their communities became important enough to warrant attention to social repercussions as part of technological and environmental impact assessment. It is widely recognized now that, even if all negative effects cannot be avoided, they should be anticipated as fully as possible. Multifaceted impact assessments that include economic, technological, environmental, and social effects help to do this. To omit these studies leaves society subject to unintended human, social, and environmental costs, and, sometimes, irreversible consequences that are more severe than the original problems that were the occasion for action.

Types of Risk Assessment

Four risk assessment categories are discussed in this section: (1) economic, (2) technological, (3) environmental, and (4) social. Even though each of the categories is presented separately, studies usually combine categories for a more holistic assessment.

Before describing these risk assessment categories, we should define a few terms that are commonly used in risk assessment literature. The term *risk* means the possibility of suffering harm or loss. It also can mean a factor, element, or course that involves possible danger or hazard.

The term *impact* means the effect of one thing upon another. Impact can be primary, secondary, and indirect or related. *Primary* impacts are direct results of the proposed action or event. *Secondary* impacts follow or occur because of a primary impact. *Indirect* or *related* impacts may be difficult to identify and attribute to the proposed event or action, because they may be unseen or not immediately apparent. For example, pond algae growth might be a primary impact of unanticipated fertilizer runoff. A change in the pond's fish population caused by the algae growth would be a secondary impact. Decreased use of the pond for recreational swimming and fishing could well be indirect impacts. The technology for determining indirect or related impacts often lags behind the presence of suspected risk. Long-term effects are extremely difficult to attribute to a single cause.

Economic Impact Assessment

Economic impact assessments are conducted by a variety of public and private agencies. Newspapers frequently carry economic impact material in categories they think will be of interest. Most major industries conduct these studies for themselves. Often state and federal governments provide reports on economic impacts of specific major economic proposals. For many years the U.S. Department of Agriculture has conducted economic outlook conferences, as have state Extension organizations. As a result, the average citizen is most familiar with this type of impact assessment. These reports and conferences usually assess potential economic impact assessments on areas such as:

- Employment opportunities,
- Tax and property value changes,
- Tax revenue and local government financial costs,
- Displacement of business and farms,
- Industry and business activities,
- Disruption of community growth,
- Cost of living, standard of living,
- Long-term productivity,
- Energy requirements, and
- Energy conservation.

Technology Impact Assessment

What is technology? To some people it means "hardware," e.g., patentable items, such as an artificial heart, computers, or birth control pills; to others, it means physical structures, such as dams, airports, and hospitals; still others define technology as an application of knowledge to achieve a practical purpose, as for example, procedures and techniques, such as matrix management and coronary artery bypass, or social technologies, such as agricultural subsidies, no fault automobile insurance, or national health insurance (Boroush et al., 1980). One definition describes technology as the systematic application of collective human rationality, with a view to achieving greater control over nature and over human processes of all kinds (Goulet, 1979). This broad definition would include all tools, physical construction, and social organizations.

Economic Impact Example Situations

A committee has been appointed to plan a state Extension conference on the future of wheat production in the light of federal policies regarding grain exports. The conference will involve representatives of the major producer and marketing groups in the state. The economic impact of international grain production and government policy on subsidies will be central to the conference.

A large industrial plant has announced that it intends to close and will lay off approximately 6,000 workers within a year. The city, with a population of 75,000, considers this plant a major contributor to its economic stability. There is some talk about a worker buy-out plan. A meeting has been called by the Human Service Council to begin assessing the effects of the plant's closing on human services over the next five years, especially since welfare eligibility requirements have been raised.

An interstate highway that will replace a major highway is being planned. This change will put a city of 40,000, which has been on the existing highway, 10 miles away from the interstate. The chamber of commerce and city officials are wondering how this change will affect the city. Some of the surrounding prime agricultural land will have to be rezoned.

Goulet's (1977, p. 66) definition illustrates more clearly the scope and dimensions of technology risk assessment:

> Technology assessment refers to the thorough and balanced analysis of all significant primary, secondary, indirect, and related consequences of impacts, present and foreseen, of a technological innovation on society, the environment, or economy.

Coates (1978, p. 397) also helps us to define technology assessment:

> Technology assessment is a class of policy studies which systematically examines the effects on society that may occur when a technology is introduced, extended, or modified. It emphasizes those consequences that are unintended, indirect, or delayed. It contains several basic assumptions. New technological knowledge creates new ignorance. More information and analysis, rather than less, promotes better decisions. Technology assessment is a policy tool useful in business as well as government.

Other important aspects of technology assessment emphasized by Coates are:

- Technology assessment is a perspective that seeks holistically to inquire into the short-term and long-term effects arising from the interaction of technologies and societal systems.

- Organization of certainty and uncertainty in order to define strategies and tactics for managing any particular technology is a major policy need.

- In the long-range, indirect and unanticipated effects of technology often are more significant than the immediate or planned consequences.

- Technology assessment is likely to be almost continuous, because new aspects must emerge and the interlocking nature of the consequences are assessed.

There are many types of technologies. The following list provides examples of typical categories:

- Communications;
- Water supply;
- Military;
- Medical;
- Food processing;
- Agricultural production;
- Electronics, robotics, fiber optics;
- Biotechnology;
- Nuclear;
- Energy;
- Forest resources;
- Waste treatment;
- Transportation;
- Shoreline and fishing;
- Mining and ocean minerals; and
- Construction and housing.

Consider many of the technologies that are commonplace today: automobiles, telephones, televisions, and computers. When these technologies were introduced, few persons could foresee the wide-ranging effects, both positive and negative, that each technology would introduce.

Technology assessment today goes beyond evaluating the best design for production and sale of new technologies. It now includes identifying present and foreseeable effects the technology may have, and planning ways to prevent unintended negative consequences.

Technology impact assessment offers opportunities for improved public policy and decisionmaking (Tugwell, 1973).

The concept of technology impact or risk assessment has had official status since 1966, when the U.S. Congress created the Office of Technology Assessment. Today, the concept has spread to a number of universities that have established programs in science, technology, and society. Some industries also conduct technology risk assessments, perhaps because of increased demands for corporate accountability.

A growing number of professionals work for specialized assessment centers, as well as government agencies (Technology Assessment, 1976). International conferences have focused on technology risk assessment. The International Society for Technology Assessment now publishes a journal. Developing nations have an active interest in impact studies, especially those related to what is referred to as "appropriate technology" (Technology Assessment, 1979). There is growing recognition that technology introduced today may have a global impact tomorrow.

Global technology assessment becomes increasingly important. With its increasing power, scale, and complexity, technology and its impacts respect no national boundary. Earth-oriented space satellites launched by one country can gather information about many countries. The smoke and air pollution of one country produces acid rain in another. Carbon dioxide and fluorocarbons released from one geographic region can have long-term effects on the global climate. Nuclear accidents, such as Chernoble, can affect many countries in many ways.

The resources of outer space and the polar regions are being explored for economic and military use. Technical development of these resources, without concern for the long-term effects on human beings and the planet, as a whole, is irresponsible and could be disastrous. According to Boroush et al. (1980), natural resources, such as those in the Antarctic, should be developed and used to the benefit of the entire world through some appropriate global collaboration. In these developments, no technologies should be used that will cause undue damage to the environment.

The effects of technology are recognized as widespread and complex. We assume that we can control, or at least reduce, negative aspects if we assess their potential. We see the advantage of studies providing an early warning for irreversible effects; and we see technology impact assessments as creating an opportunity to examine and explore the value issues associated with technological effects and benefits.

Technology risk assessment also is demanded by citizens' concerns about the effect of new technologies that are introduced with little or no public input. The results of technology risk assessments, written for the lay person, can be valuable tools for improved and informed citizen participation in public policy decisionmaking.

Technology Impact Assessment Example Situation

Stimulated by the National Electronic Technology Task Force Report (1986), the State Director of Cooperative Extension has appointed a task force to consider an assessment of the impact of electronic technology on Cooperative Extension in the state. A veteran Extension educator has expressed concern that computers and instructional technology are getting so much attention that there may be no need for the traditional role he has played for so many years. It is difficult for him to imagine himself using a computer.

Environmental Impact Assessment

Environmental risk assessment was an issue of the 1960s and remains an issue today, as more and more people recognize the finite nature of our environment. In the 1960s, environmental risk assessment emerged in response to technological threats to the environment. Assessments were promoted by socially and environmentally concerned groups who questioned the value of economic gain over environmental preservation. These groups argued that other values were equally or more important than economic growth, and these values should be included in policy decisions (Manheim, 1984). The environmental movement has shown steady growth in financial contributions to environmental protectionist groups over the past two decades, and the values these groups represent are strongly held by large segments of the public.

Environmental impact assessment has become an integral part of the procedures of all major federal actions that might significantly affect the quality of the physical and human environment. Since the National Environmental Protection Act of 1969, federal oversight has depended, in large part, upon the Environmental Protection Agency. The following environmental and social effects to be considered in impact assessments are listed in the Act:

- Assure safe, healthful, productive, aesthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without environmental degradation, risk to health or safety, or undesirable and unintended consequences.
- Preserve historic, cultural, and natural aspects of our national heritage, i.e., an environment that supports diversity and a variety of individual choices.
- Achieve balance between population and resource use that permits high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources; approach maximum attainable recycling of depletable resources.

Protection of the environment has been a long struggle that began, at the turn of the century, with great controversy over the establishment of national parks, national forests, and wilderness areas. More recently, the environmental movement has generated many "grass-roots" groups that have had positive effects on plans and policies to protect the environment. Behind virtually every wilderness area and national park, and each piece of urban open space, is a group of citizens, some of whom have worked long and hard to promote and protect it. Most of the federal and state environmental laws enacted in the past few years had no "teeth" until grass-roots groups went to court to assert the rights of all citizens (Robertson and Lewallen, 1975).

There also is growing recognition that pollution is not confined to large manufacturing concerns. Everyone is a polluter. Individuals unintentionally endanger the environment by purchasing products that pollute either through their manufacture or their improper disposal. The Sierra Club has emphasized in its publications the impact of everyday household chemicals that can be hazardous to the environment. The group also recommends alternatives.

Environmental risk assessments are complicated and costly. The average Extension educator will probably not be involved in conducting one. Instead, his or her task may be to identify situations in which environmental risk assessments should be conducted, and disseminate information regarding risk to the environment. The Extension educator may assist groups in clarifying issues, or link groups with experts who have the answers or who conduct environmental risk assessments, when needed.

On the federal level, the Environmental Protection Agency is responsible for environmental risk assessments. State agencies, with responsibility for environmental risk assessments, vary from state

Environmental Impact Assessment Example Situations

The State Department of Health has identified high concentrations of dioxin in a three-county region. At present, there are no agreed-upon standards regarding the acceptable risk levels for dioxin. County health officials and citizen groups are concerned about what this will mean for future generations and the health of the region. Farmers want to know how this finding will affect them.

Present country landfills have been ordered closed within two years. County government has appointed a committee to investigate the future of solid-waste disposal alternatives. Citizen groups are organizing to prevent a possible landfill site selection in their neighborhoods. An Extension professional has been appointed to the county government committee.

With the price of oil going up once more, the prospect for potential mining and transportation of coal in a Western state has prompted the state government to contact the Secretary of the Interior about a possible study of the physical, environmental, and social impacts of coal production on the region. The Sierra Club and other environmental groups also have expressed concern over the impact of coal mining on the region. The Extension Natural Resources Program Specialist has had numerous requests for information on what is happening, and what could happen.

Native American Indians on a reservation have contacted an Extension professional about the possibility that their wells are contaminated from agricultural pesticide and fertilizer runoff. They wonder what the future of their reservation will be if they do not have potable water.

to state. Typically, the state departments of public health and natural resources and departments of agriculture are responsible for conducting environmental risk assessments. The following are examples of effect categories that may be required for an environmental risk assessment:

- Air quality;
- Visibility;
- Noise;
- Geography, topography and minerals;
- Soils;
- Water resources;
- Vegetation;
- Wildlife;
- Paleontology;
- Archaeological resources;
- Native American concerns;
- Visual resources;
- Recreation;
- Wilderness;
- Land use, agriculture, forests; and
- Transportation.

Social Impact Assessment

During the 1970s, there was widespread recognition that it was not enough to be concerned about the environment, while ignoring the social effects of major interventions. Many environmental impact assessments began to include social impact categories. For example, these social effects were added to the Rivers and Harbors Act of 1970.

- Destruction or disruption of man-made resources, natural resources, aesthetic values, community cohesion, availability of community services, institutional arrangements, recreation or leisure opportunity, and education;

- Adverse effects of air, noise, and water pollution;
- Disruption of desirable community growth;
- Conservation of energy (nonrenewable resources); and
- Productivity of energy requirements (renewable resources).

Likewise, in 1973, the National Environment Protection Act was amended to limit harmful effects in the following categories that are similar to those added to the Rivers and Harbors Act: community cohesion, community growth, noise, employment and labor force, local government finance, tax revenues, property values, health, safety and security, employment opportunities, displacement of people, and displacement of farms.

Effect categories that may be required for social impact assessment abound. Examples of typical categories are:

- Health and safety;
- Variety and diversity of choice;
- Equality of opportunity and benefits;
- Population mobility, density, displacement;
- Human service availability;
- Aesthetic value;
- Community cohesion;
- Leisure opportunity;
- Historical continuity;
- Psychological security;
- Neighborhood stability;
- Housing availability and quality;
- Public services; and
- Racial concentration, diversity.

Social Impact Assessment Example Situations

Several large manufacturing plants and research centers have announced their intention to move to farmland adjacent to a small town of 5,000 residents. Local government officials are elated, on the one hand, about the expected economic growth and the possible increase in their tax base. On the other hand, they are quite concerned about the costs of this expansion, the impact of the expansion on their current life-styles, and the future of the area if the manufacturing plants ever close.

The city government has proposed a major urban redevelopment project that will relocate at least 20,000 current residents. The families of the Expanded Food and Nutrition Program (EFNEP) will be among those most affected. At stake are conflicting visions of the future of the city, and conflicts over potential benefits and losses. Cooperative Extension plans to hold a meeting for its program constituents on alternative ways cities have undertaken urban development, and their effects on the future of the cities and their residents.

The EFNEP assistants in a county report that their families are upset that the Department of Social Services has been directed by county government to move the Social Services and Employment offices from downtown to another location which is in the suburbs. The county says that it has available space in the new location, and needs the space in the downtown area for other functions. The EFNEP families say that the suburban location will mean increased transportation costs and three times the amount of time to make their visits. An Extension nutrition staff member wants to know what the social impact of this change could be for her constituents.

A proposal to merge a number of small rural schools has caused concern among small-town local government officials. They see school closures as hastening rural social and economic decline. The school officials point to the need to offer a curriculum that prepares youth for the year 2000 and beyond, and argue that the resources cannot be provided in the existing small rural schools with their small enrollments. An Extension agent has been asked if the land-grant institution has any information on how school mergers in rural areas have affected rural social and economic life.

The impact categories listed for each of the four risk assessment areas have been artificially separated in this presentation. Most impact studies assess combinations of economic, technological, environmental, and social impacts (Fowles, 1976; Johnson, 1978; Manheim, 1984).

Purposes of Impact or Risk Assessments

The primary purposes of economic, technological, environmental, and social impact or risk assessments are to prevent adverse effects and to identify adaptations for specific proposals that attempt to satisfy conflicting values. More specifically the purposes are to provide:

- An information base for understanding complex effects of proposals for construction, new products or technologies, new policies, and service provisions;
- An early warning system to identify and prevent adverse effects;
- A tool for citizen groups to use to protect the public's interest and the interests of future generations;
- A means of identifying alternative approaches, technologies, and adaptations that are relatively less harmful; and
- A basis for planning that involves affected Extension publics.

Procedures for Impact Assessments

Rarely is a project proposal confined to a single option; usually a variety of alternatives are available for consideration. The various groups having an interest in a study are likely to be unclear as to what the potential problems are. Thus, the nature and scope of the problem may be redefined many times.

Many qualitative and quantitative tools can be brought to bear on the issues: economic cost and benefit analysis, trend extrapolation, systems analysis, social surveys, historical surveys, historical analogy, Delphi, conferences, workshops, briefings, hearings, advisory committees, moot courts, artistic judgment, on-site field investigation, scaling techniques, and scenarios (Coates, 1978). Cooperative Extension has recognized the importance of helping communities plan impact analyses (*How Extension Can Help, 1982).* A broad range of methods is being used with a variety of contexts (Tester and Mykes, 1981). In addition to the variety of possible techniques for impact assessments, planners and developers also vary concerning the extent of citizen involvement that they encourage. Therefore, it is impossible to identify a single, general methodology applicable to all potential impact situations.

However, regardless of the specific techniques employed, there is a basic process for impact assessment. According to Coates (1978), there are seven major steps in making an impact assessment.

1. *Define the assessment task.* Discuss relevant issues and any major problems. Establish the scope (breadth and depth) of inquiry. Develop project ground rules.

2. *Describe relevant technologies.* Describe the major technology being assessed. Describe other technologies that support the major technology. Describe technologies that are competitive with the major and supporting technologies.

3. *Develop state-of-society assumptions.* Identify and describe major nontechnological factors that influence the application of relevant technologies.

4. *Identify impact areas.* Ascertain those societal characteristics that will be most influenced by application of the assessed technology.

5. *Make preliminary impact analysis.* Trace and integrate the process by which the assessed technology makes its societal influence felt.

6. *Identify possible action options.* Develop and analyze various programs

for obtaining maximum public advantage from the assessed technologies.

7. *Complete impact analysis.* Analyze the degree to which each action option would alter the specific societal impacts of the assessed technology discussed in Step 5.

Decision Dilemmas of Impact Assessments

Several conflicts are inherent to impact assessments. These conflicts are political in nature and usually call for public policy education. (See **Module 6: Education for Public Decisions**). Typical trade-offs or decision dilemmas associated with most impact assessments are:

- Short-term benefits versus long-term costs;
- Tolerable risks versus benefits and costs;
- Economic growth versus environmental protection;
- Decentralized, simple, citizen controlled technology versus centralized, complex, corporate or government controlled technology.
- Benefits to some versus burdens to others; and
- Benefits to present generations versus costs to future generations.

One purpose of an impact study is to make these choices manifest. The choices obviously are not all technical, but are value-laden and political as well. They reflect social goals. There are no "hard research" answers to such questions, or established degrees of tolerable uncertainty and risk. These are political issues at stake among special-interest groups, organizations, government, the general public, and those who are attempting to represent future generations.

The Role of Participation in Impact or Risk Assessment

To some extent, technological, environmental, and social impact or risk assessments are attempts to exert democratic control over unbridled development and special-interest group benefits that could be implemented, at the expense of the public interest. As such, participation in the assessment is as important as its findings. Citizen involvement can assist in bridging the gap between factual technical analysis and value-oriented policy decisions. Several approaches to participation that have been tried include:

- Gathering data from a wide range of parties that are likely to be affected;
- Including interested parties and stakeholders on advisory committees to plan, analyze, and react to the assessment;
- Involving interested parties in working together to create adaptations and alternative plans for innovations, once their potential impacts have been assessed; and
- Encouraging and conducting participatory research controlled by interested parties.

This last form of involvement can be particularly important in situations in which government agencies are unresponsive; try to minimize or cover up consequences that are embarrassing; or receive limited resources for risk assessments. We should remember that participatory research originally documented hazardous conditions at New York's Love Canal and brought the findings to the attention of public health officials. The influence of many grass-roots groups has resulted in government and industry carrying out technological, environmental, and social risk assessments.

People need to act to protect themselves. The content of **Module 5: Working With Groups and Organizations,** provides material that can help citizen groups in their involvement and participation in risk assessment.

Roles for Cooperative Extension

Cooperative Extension personnel can perform the following roles in relation to impact assessment:

- Identify conditions and situations that require impact assessments;
- Act as brokers between citizens and organizations that perform impact studies, including the land-grant institutions and government agencies;
- Disseminate findings from impact assessments to the general public; and
- Facilitate dialogue among interested parties concerning the value bases for decisions.

Groups That Conduct Impact or Risk Assessments

A number of private research organizations conduct technological, environmental, and social impact assessments. Some universities also engage in impact assessments, as do some state government offices. The following federal agencies conduct assessments. Their addresses are available from any public or university library.

- Economic Research Service (ERS)
- Office of Technology Assessment (OTA)
- Congressional Research Service (CRS)
- National Science Foundation (NSF)
- Midwest Research Institute
- Agricultural Research Service (ARS of USDA)
- Organization of Economic Cooperation and Development (OECD)

Summary: Prevention and Adaptation Techniques

The use of prevention and adaptation techniques in generating futures perspectives begins with a focus upon a specific proposed action or situation, and proceeds with an assessment of the potential risk, hazard, or undesirable consequences. Different types of risk assessments (economic, technological, environmental, and social) focus on unique effects. However, effects from several of these categories are likely to be included in any specific assessment.

Major purposes of any prevention and adaptation technique are to make the value choices and conflicts manifest, to enlighten decisions, and to protect the public interest. Citizen involvement is essential to bridge the gap between factual technical analysis and value-oriented policy decisions. Extension educators can act as network builders between the public and organizations that perform impact assessments, including land-grant institutions. These Extension educators also can provide public policy education programs for their publics on the implications of risk assessment reports, and facilitate dialogue among interested parties.

Unit V. Invention and Creation Techniques

Invention and creation techniques for futures perspectives differ from other techniques in that the future is no longer viewed as a continuity determined by the past, or as an unintended consequence to be avoided. Rather, the future is viewed as a creative possibility. The world is viewed as "open," rather than as "closed." The future is not considered as something that is already decided and that gradually reveals itself to us, but as something that is to be invented and created. This approach to the future depends on the "art of conjecture," and the capacity to create positive images of the future that overcome pessimism, fatalism, and distrust of change (de Jouvenal, 1967). This approach invites us to expand our choices, raise our aspirations, and experience a new motivation for positive action that imaginative possibilities can bring (Mendell, 1978). Those who accept the invention and creation way of viewing the future believe that social and cultural change is a product of the interaction of images of the future with present structures, beliefs, and values. Having a mental image of what we want is practical; it leads to decisions designed to make the present more like the desired future (Boulding, 1973; Fowles, 1978).

Those who take an invention and creation perspective assume that one begins with a clear vision of the future that can inform the present. The emphasis is upon a guiding vision, directing idea, preferred condition, valued future, or impelling goal. What is important to this perspective is that alternative ends become defined and contrasted with existing reality; resources are harnessed; and strategies are selected in service to the vision. We are called upon to look ahead, to stretch our minds to be creative, to grasp the unstructured and then to link it to the present. Present reality is viewed as tethered to the vision, rather than the reverse.

All of the invention and creation techniques presented in Unit III have several common ideas. First, these techniques are used as extensions of our preferences and values. Second, the techniques assist the viewer in going beyond assumptions and ideas that bind us to the repetition of the past. Third, invention and creativity are the product of intuitive, as well as analytical, thinking. Fourth, the tension between the vision and the reality of the present is viewed as a gap that, to some extent, planning and creative imagination can bridge. Fifth, the vision is not set in concrete; it is constantly being modified. Most of the suggested techniques can be used with individuals, families, groups, and organizations.

Robert Theobald (1972, p. 231) suggests that our task as Extension educators is to challenge our publics to participate in creating the future:

> There is, however, no way to teach the future without your participation. You must be involved if you want to get any real sense of your possibilities, those of the society, and those of the world. The time when you could be objective and noninvolved and still learn has passed. At least this is the view that I hold. Probably, you too believe that human beings have to create a future for themselves.

Generic Approaches to Invention and Creation

Before describing several invention and creation approaches for futures perspectives, let us consider some of the more generic approaches that have been found to free up the mind for invention and creation.

Elimination of Obstructive Patterns of Thinking

Edward de Bono (1972) suggests that it is possible to increase one's capacity to invent by identifying and eliminating obstructive patterns of thinking. Some of these obstructive patterns are:

- Believing something that is factually wrong;

- Assuming that something is complete when there are other possibilities;
- Stating something too generally so that exceptions are not permitted;
- Assuming that something always works in a forward, not backward, sequence;
- Stating something as an "either/or" when there are other points on a continuum, as well as some things that are not on the continuum at all;
- Limiting one's ideas to existing moral and legal boundaries of conventional wisdom;
- Assuming that time boundaries, "before," "after," "during," and "between," are fixed;
- Assuming that spatial boundaries containing "inside," "outside," "within," and "between" are places where things must happen; and
- Assuming that what we have habitually associated as going together must not be broken apart into new combinations.

We often can eliminate these patterns during problem solving simply by asking ourselves whether or not we are making some of these obstructive assumptions. Alternatives usually come to mind when obstructions are removed.

Another approach to creative thinking is the use of analogies and the creation of metaphors. An *analogy* assumes that two or more things corresponding in one characteristic correspond in another. For example, if the head of an organization behaves like a military general, the staff can be described as field officers and foot soldiers.

A *metaphor* is somewhat less precise. The metaphor provides a secondary subject through which we can interpret unique meanings of our primary subject. Those meanings that the two subjects have in common may give us a new perspective on the primary subject. For example, we may envision the future of our organization through the metaphor of a family. Thinking of our organization as a family will produce different creative images than viewing the future of our organization as a clock or as a machine.

Still another approach to creative thinking is to ask ourselves leading questions, ones that challenge our assumptions. The following are examples:

- If natural events run their course, what will be the situation?
- Can an object or event be used for a different purpose in the future?
- Who has an interest in changing the situation?
- Can we make any small changes that would make large differences in the future?
- What would cause the object to disappear?
- What are our assumptions about people, the system, the world?
- How else could the system and its purposes be fulfilled?
- What values are central to us?

Brainstorming

Probably the best known of all the inventive futures methodologies is "brainstorming," which was formalized by Osborn in 1938. Since then, he has refined the process (Osborn, 1953). Other creative thinking techniques followed, such as synetics (Gordon, 1961), morphological analysis (Zwicky, 1976), and imaging and envisioning (Ziegler, 1982a, 1982b, 1984, 1985). Parnes and Harding (1962) summarized the early work on creative thinking. Participants who want to know more about the meaning of these approaches are encouraged to read each of the authors just mentioned.

Brainstorming techniques originally were designed to stimulate spontaneity and to "free up" our minds from their ties to traditional patterns of thinking;

and, through trading and building on others' ideas, to generate a maximum number of new ideas with regard to certain situations. The process calls for generating as many ideas as possible. The demand for quantity produces suggestions that range from obvious to "off-the-wall." Criticism is initially withheld; then, improvement is encouraged through building on, combining, or adapting ideas. Ideas relating to future possibilities are evaluated; filtered through criteria; distilled or clarified; and analyzed with relation to the present situation (Rickards, 1974). Most variations of the brainstorming process include procedures that center around the following questions:

- Are we working on the right problem or vision?
- Can we break our logical thought patterns?
- Can we become more receptive to new ideas or visions?
- Can people with different backgrounds help?

Reflection on Preferences and Values

Another way to cultivate positive visions of the future is to reflect on one's own preferences and values, as well as those of others. In this approach, we ask ourselves what we cherish, and what the future condition of a family, an organization, a community, a region, a nation, or a world would be if we and others took that value or preference seriously. Instead of waiting until our preferences and values erode or are directly attacked, a basic assumption in the preferences and values approach is that we have the capacity to stand back and see with our inner eyes what is important to us and to our society. We then can envision a future state that embodies these values; identify the structures that will support this vision; and undertake the strategies that will assure its creation.

All three of these generic techniques for enhancing creativity (eliminating obstructive patterns of thinking, brainstorming, and reflecting on preferences and values) can be used to create alternative futures perspectives. In the remainder of Unit III, we build on these generic techniques and describe specific techniques for generating futures perspectives.

Major Techniques for Invention and Creation

Although there are many combinations of the generic techniques for enhancing creativity that have just been described in Unit IV, we introduce six techniques selected as relevant and feasible for use by Extension educators. Each of these techniques has been used in organizational or community situations with publics familiar to Extension. The six techniques are: (1) preference surveys; (2) value audits; (3) images and imaging; (4) scenario building; (5) futures history writing; and (6) action planning. Although described separately, these six techniques should be viewed as complementary, and as parts of an unfolding process that leads toward action in the present.

Preference Surveys

A preference survey is a technique to expand the involvement of persons in providing input to the creation of desirable visions of the future. A preference survey is just that—soliciting peoples' opinions, desires, wishes, or values about their preferred future for a particular situation or environment.

It may be desirable to conduct a Delphi analysis (a technique explained in Unit III, "Projecting and Forecasting") in the form of a preference survey among experts, as well as a preference survey among a broad range of citizens. In some cases, the survey is designed to collect further images for the planning process itself. In others, it is designed to determine the amount of support for specific images or plans. Sometimes, multiple visions of development are presented in a survey, with opportunity for respondents to provide their preferences and comparisons among the choices, or to add to the images or visions of the future.

Preference surveys have been used to design courses and adult education programs (Bielby, 1980; Schuttenberg et al., 1984). They have been employed as tools in career planning (Lux, 1974), organization marketing for higher education (Luciano, 1978), and for community development and comprehensive land-use planning (Garkovich, 1979; Mudrak, 1982).

Statistically, it is desirable to gather expressions of preferences from all those who could be affected by implementing images of the future. More often than not, this approach is logistically impossible. Therefore, one must either use a random sample or a categorical sample. Random samples are helpful in defining common agreement within a total population.

To create a categorical sample, we select respondents from groups or categories of people whom the researcher anticipates will have quite different views from the population as a whole. For instance, an Extension educator who is planning a survey on "Goals for Our County in the Next Century" might draw a categorical sample from different types of voluntary associations, civic and cultural clubs, on the assumption that it is important to include their views, since they would probably play an important role in setting and implementing these goals. Comparisons of preferences among the different groups is usually quite helpful in identifying how groups may differ in their values and preferences.

An additional way to view the selection of categorical samples is suggested by Linstone and Simmonds (1977), who point out that persons with a personal perspective have concerns and values that differ from those who take an organizational perspective or a technical perspective. Personal concerns usually are voiced by the individual citizen, service user, client, or program participant. Organizational concerns usually are expressed by administrators, employees, funders, and stockholders. Skilled workers, professionals, and scientists view situations through technical concerns. Class, ethnic, and age categories also can be used to assure diversity in categorical samples.

Another challenge in conducting a preference survey is that of asking the right questions in the right way. In some cases, open-ended questions can elicit responses on what people would like to see happen. In other cases, a survey might show alternatives as pictures or drawings of what the future object, environment, or organization could look like. In still other cases, in which the choices have been narrowed to specific alternatives, the alternatives can be explained in detail. Preference surveys provide the opportunity to involve people in creating a vision and can draw forth their support, as well as educate them regarding alternatives.

Purposes of Preference Surveys. Preference surveys are used to identify aesthetic, ethical, life-style, or environmental preferences of various constituencies regarding activities, objects, events, places, organizations, or community policies. The findings are used to make comparisons between the preferences and existing situations. The survey process can generate consensus and support regarding future images and goals toward which persons and groups will contribute.

Procedures. There are many forms of preference surveys. However, in all of these the procedures include the following general steps:

1. Identify the focus of the preference survey, the decision to be made, areas to be explored, and general questions to be asked.

2. Identify either a random or representative sample of populations that represent at least three perspectives:

(a) personal, (b) organizational, and (c) technical.

3. Survey the sample groups through mailed questionnaires, or individual or group interviews. Informants are asked to respond to open-ended questions, matched pairs of alternatives, or rank orders of alternative proposals. Be sure the questions provide the needed information and are appropriate for your respondents.

4. Analyze the data by contrasting the various perspectives that are represented. Identify both common preferences and those that are held by specific groups.

5. Use the findings as a basis for dialogue leading to decisions to support particular preferences.

6. Generate action plans that are consistent with the common preferences among the decisionmakers, special interests, and persons most affected. Allow enough time and opportunity to achieve the needed compromise and consensus.

Values Audits

The values audit, a relatively new invention technique, is used to generate a positive vision of the future of an individual,

Preference Surveys Example Situations

The National Park Service Resource Planning Act mandates that recreational planning occur in every state. The Extension State Director was requested to make an appointment to the advisory committee that the state formed. The appointed Extension professional suggested that the advisory committee undertake a preference survey among a broad range of organizations and citizen groups regarding priorities for future recreation development in the state.

City officials were planning to fill in and cover up a number of ravines that run through several areas of the city. The Planning Department suggested that a preference survey be conducted first on what city residents preferred. The Planning Department staff was very surprised to find that their constituencies felt strongly about the future of those ravines. People of all ages suggested that the ravines be cleaned up and made into park-like areas. Many residents can recall positive experiences associated with those areas.

An Extension educator, who works with the County Office for Aging is asked if there are resources to help elderly persons think about their future housing options. Some who work with older persons report that many of their clients do not want to talk about future housing possibilities, because they think it means going into a nursing home. The Extension educator suggests the use of a preference survey to understand better the housing preferences of older persons, as well as to stimulate conversation among them regarding their realistic alternatives.

A 4-H program advisory committee has asked state Extension program specialists for help in thinking about future delivery methods for 4-H. Their community has become more urban and multiracial. 4-H Club participation never has been strong. An Extension specialist suggests a preference survey of various community leaders and youth regarding preferences on future delivery methods and content of programs.

The Executive Committee of the Council of Homemaker Clubs in a large suburban area has asked the Extension home economist to help the Council consider its future directions and options. The home economist suggests the use of a preference survey among club members in which a variety of future directions and options are listed.

a family, or an organization through identifying and clarifying values. Action to strengthen particular values is then encouraged. Described as an offshoot of the corporate social audit, which is an attempt to assess the types of human concerns that are immediately apparent to employees, values audits have been applied to universities, colleges, and continuing education organizations. The audit is a clearly stated attempt to reflect an organization's value concerns and visions of social well-being among its members, and to build on those aspirations for organizational development. Although values audits have been used by organizations, individuals and families also could use the same procedures.

Organization values audits focus on the values that are ''at stake'' in key decisions and areas of institutional policy (Smith, 1984). Not only does the technique strive for a better understanding of the culture of an organization, but the values audit should lead to an ongoing process in which decisions are examined with relation to identified values that are to be strengthened for the sake of creating a more desirable future.

In the past, organizations have been understood as structures, rules, and policies. After a time, they were studied as human resources and human relations systems. Still another way of viewing organizations is through their policies, influence patterns, and power relationships. More recently, organizations are being viewed as distinct cultures with values, rituals, celebrations, and norms that provide a clue to motivation and the way people feel. A values audit attempts to tap into these cultural aspirations and then to look at the structures, the human resources, and the political influences that may be in contradiction to what the members or employees of the organization want or imagine for the future. The discrepancies between what people say they value or what they envision for the future, and the way they or their organization operate, may provide the incentive for positive change.

Purpose of Values Audits. The purpose of a values audit is to identify basic positive values and images of the future for an individual or an organization. The identified values then are used in reflecting on, discussing, and identifying implications for those values and images. Those positive visions of the future then are institutionalized through strengthening selected values that are perceived at the core of the positive vision.

Procedures. The general steps of a values audit for an organization are the following:

1. Form a values audit steering committee drawn from representatives of all areas and levels of the organization.

2. Conduct a values inventory on the way members of an organization perceive the values of an organization, and the values they would like the organization to conserve or emphasize in the future. This may be done through group or personal interviews, or mailed questionnaires. Often, an external consultant provides leadership for the audit, to increase objectivity, or to lessen the threat to organization members who might be seen as ''rocking the boat.'' Including as many persons as possible is the best way to assure success.

3. Conduct an analysis of the data collected from the values inventory. A values inventory report is written and distributed throughout the organization.

4. Encourage dialogue among members, units, or levels within the organization in response to the inventory report.

5. Select values that members, units, and levels collectively can affirm and strengthen.

6. Commission or invite organization members to write papers on each of the selected values. In these papers, the writers should describe visions of the organization that fulfill those values. The papers are used to focus attention on implications for action for the organization and its future.

7. Institutionalize new organizational policy and procedures that are congruent with the consensus on those core values to be strengthened. Continue dialogue about emergent value concerns.

A values audit conducted with individuals or families would include the following steps:

1. An agreement to undertake a values audit is negotiated between an educator and participants.

2. With the help of the educator, participants identify and list the values that they would like to emphasize in their future. Reflection on positive past experiences can help the process. Introspective tests or questionnaires also can be used.

3. Participants are encouraged to write, in detail, the implications of the values for a vision of their future and for specific behaviors and decisions that would be required to strengthen those values. These descriptions are then used to make contrasts between the way persons behave in the present and the decisions they are now making.

4. Participants develop plans for making present behaviors and decisions conform to the value-enhanced vision of the future.

A values audit in an organization is rather broad-based, and, as such, lends itself well to long-range concerns. To date, the Society for Values in Higher Education has conducted values audits in eight colleges and universities. The technique can be used by almost any organized group that wishes to reflect on the values that characterize its aspirations and that hold the group together.

Images and Imaging

One of the earlier forms of using images as a basis for viewing the future and engaging in personal, organizational, and social change was designed by Fox et al. (1973). This design was later modified by Lippitt et al. (1978) by adding Lewin's (1948) force-field analysis, which identifies factors that promote or inhibit change. The Lippitt group's design, called "Imaging Potential: From Goals to Action," has been used primarily to facilitate future-oriented organizational change. The approach was designed initially as an alternative consulting tool to counteract negative and unproductive sessions that produced blame and depression among participants when a problem analysis approach was used. The consultants found that, by thinking about the future and the identification of "achievable" goals, the members of the organ-

Values Audit Example Situations

Considerable conflict among organizational levels in the state Extension service is reported to the office of the State Extension Director. The Director suggests that an outside consultant be brought in to conduct a values audit, and to focus on future organizational arrangements to strengthen the values identified during the audit. The values audit report will serve to stimulate constructive dialogue concerning the values that may be at issue in the conflict between organizational levels.

A large church in a downtown area is trying to decide if it should stay in its present location, or move to the suburbs. The minister has asked an Extension educator, who is a member of the congregation, to chair a committee to think through the way the congregation could face this decision. The committee has proposed a values audit among members and the use of a minister in a nearby congregation as an outside consultant to the process. The committee intends to use the findings of the values audit to engage members of the church in dialogue regarding which location or locations are likely to allow the strengthening of their various values as a congregation.

ization could bypass their current frustration and concentrate on what they could do to improve their organization. The consultants asked people in an organization to visualize positive images of their organization one to five years from the present. From these images, participants were asked to formulate goals and to select those that they thought they could reach, with some concerted analysis and effort. Several elements were viewed as important to the process. A consultant or facilitator who provides a positive environment was thought to be essential. The vision of the future must not be trivial, nor yet too utopian. The selection of ''achievable'' goals, as well as the quality of consultation on strategies designed to weaken the restraining forces, were viewed as critical.

Futures-Invention Associates was founded in 1978 by Warren Ziegler to train persons in the methods of discovery and invention. In his ''Mindbook'' series, Ziegler (1982 a, b; 1984; 1985) incorporated most of the ideas described by Lippitt et al., and others. Ziegler created a number of new activities called ''futures invention techniques.'' These techniques are being used by a wide range of individuals, professions, communities, and organizations that are dissatisfied with some aspect of the present and intend to bring about some change in the future. The invention and creation techniques descriptions that follow are drawn, almost entirely, from Ziegler's work. Descriptions of techniques are quite brief; additional information may be obtained from The Futures-Invention Associates, 2026 Hudson Street, Denver, Colorado 80207.

Ziegler describes futures-invention as ''an art,'' sometimes difficult to practice, that uses the language of images and builds on the motive of strong human intentions to enable persons to invent a future that has not previously existed. Ziegler (1982a, p. 9) noted that the aim of futures-invention is,

> . . . to help people to bring into existence a not-yet-occurred state of affairs; to fashion, to create, and to design new practices, new institutions, new ways of being and doing within the context of their concern.

He warns that the more the process is rushed, the more likely that imperfect and false images of the future will be generated.

The imaging process begins with participants reflecting on images of the world they want to bring about. The sequence of exercises enables participants to move from creating general images to specific images of their focus of concern. Then, they engage in analyzing and scrutinizing their images. Images that lack justification or importance are discarded. Those that are judged to be significant and compelling are selected for further efforts of invention and clarification. Participants are encouraged to share their selected images with others, usually in small groups of three. These small groups are for story-telling, image-sharing, clarifying, and analyzing.

The next stage of futures-invention requires participants to work collaboratively to clarify and focus on common visions, intentions, and commitments, and to select central themes and compelling images. Scenarios and futures histories are created. The third stage encourages action planning: analyzing factors that would enhance or inhibit the chances for such a future, identifying possible resources, and instrumentation. All of these stages can be viewed as extensions of the processes described in **Module 2: The Extension Education Process,** and **Module 4: Situational Analysis.** Some participants' images and action plans require participation in public policy education, as described in **Module 6: Education for Public Decisions.**

Purposes of Imaging. The purposes of the imaging technique are to generate and expand concrete possibilities and options for choice for the future. Some of these possibilities and options will motivate persons, families, groups, organizations, and community leaders to bring into existence a not-yet-occurred state of affairs; to fashion, to create, and to design new practices and new institutions; and new ways of being and doing within the context of their concern (Ziegler, 1982b).

Procedures. The general procedure for imaging, summarized from Ziegler (1982b, 1985), includes the following steps:

1. Identify the individuals, groups, or organizations that can contribute to a process of imaging a positive future for a specific concern.

2. Begin, in a workshop setting, by identifying and focusing on specific concerns each participant has for the future. These can be listed on newsprint or a chalkboard.

3. Identify common concerns so that collaboration among those with similar concerns can occur through the remainder of the process.

4. Demonstrate that participants can and do image, when they recall concrete mental pictures of interesting or important experiences from their own personal past. They are to practice bringing forth images, letting them flow, and capturing them in word pictures so that someone else can "get the picture." Recollections of good times and places, positive learning experiences, and events of achievement or risk taking are good places to start.

5. Generate concrete images of the future in general categories or domains of human experience: learning and education, governance, family, religion and spirituality, work, and community. Participants should not interrupt the process by raising practical questions about feasibility, probability, believability, and so on, at this point. *Concreteness* means visualization of places, people, actions, behaviors, and the use of the physical senses. As an observer of our own image, we ask, "What is happening?"

6. Share images of the future in small groups. Listen carefully and sensitively to others. This conversation is like story telling in an atmosphere that is supportive, empathetic, probing, and positive rather than disbelieving, judgmental, argumentative, suspicious, and negative. The mood should encourage enjoyment of differences among the various images.

7. Initiate focused imaging of the future. Participants take the concern identified at the outset and generate clear, concrete, specific images that are anchored with examples of who is doing what, with whom, when, where, how, and why. They are to look around in that future and render it present by living it and identifying specific objects and events that could be used as evidence, in the future, that they have happened. These focused images of the future are to be written down, in detail. Those descriptions become the building blocks for later inventions.

8. Participants receive feedback on focused image descriptions in small groups. With as open a mind as possible, listeners hear the vision of the future and participate in it in their imaginations by living, tasting, and feeling the images without judging them. They then interpret what they are hearing, and make judgments about whether or not the vision of the future makes sense, seems plausible, and mirrors their preferences. Comments should reduce possible confusion or misinterpretation. Through this feedback, participants receive new perspectives on their images.

9. Search the focused images for an underlying central theme or themes. Identify those images that have so captured participants' imagination that they will not be able to dismiss or forget them. Participants can "test" an image by mentally moving into it and living it.

10. Engage in story telling in the large group, asking participants to report their most compelling images on newsprint: words, phrases, indicators, songs, dances, diagrams, pictures, and symbols. Identify images of the future that share a central, common, or compatible vision.

11. Form collaboration or imaging teams among those who have discovered central, common, or compatible visions of the future. Without losing their individual visions, team members work together to create common, compelling images by filling in details on institutions, sectors, domains, delivery systems, technology, work roles, family roles, and citizen roles and activities. Agreements are to be written down. Discussion takes place in the future time to make the visions come to life. Break teams into subteams, if fundamental disagreements arise.

The imaging process is a practice, a discipline, and a literacy in the sense that *literacy* means the ability to express one's self in the symbols of a culture. *Imaging* means paying attention to what is important and letting one's imagination take wing. The analytical task of sorting out inadequate, inappropriate, and weak images occurs after the images have been created. The process alternates between imaging as individuals and then sharing with others what is personally created, first, in small and then in larger groups. This alternation provides a balance between the internal, intuitive process of creativity and the creativity that emerges through dialogue and collaboration. The process requires a facilitator who can establish a learning climate that supports searching, listening, sharing, collaborating, and clarifying, without being judgmental.

Ziegler (1985) suggests ten rules that comprise what he calls the "grammar of imaging." They are:

- Rule 1. Be concrete and specific.
- Rule 2. Do not interpret your image.
- Rule 3. Yield to your images; let them flow.
- Rule 4. Shift one or more variables or factors in your image and discover what happens.
- Rule 5. Withhold plausibility and preference judgments about your images; do not censor.
- Rule 6. Return to your image when in doubt.
- Rule 7. Feel the image; internalize it.
- Rule 8. Never force the image.
- Rule 9. Always be prepared for new images.
- Rule 10. Move into the time and place of the image and live it.

Imaging Example Situations

An ad hoc committee of persons concerned about home care for the aging has met in the conference room of the County Office for Aging. They have decided to analyze trends among an increasing elderly population, and to create a vision of what adequate provision of long-term home care for the aged would look like for the county. An Extension educator will lead them through an images creation process.

An increase in recreational fishing in the region has brought about overcrowding in public accommodations. An Extension educator has been urged by a Sea-Grant specialist to convince single-family homeowners to open up bed-and-breakfast services. The Extension educator is planning an imaging process to help potential service providers envision the changes in their lives, if they make their homes into bed-and-breakfast establishments. She hopes that many of those who go through the process will choose to undertake the service.

continued

Recent shopping mall developments have contributed to the decline of shopping areas in surrounding small towns. Town officials in several of those towns are holding regional meetings of town officials to look into the future of the rural shopping areas. An Extension educator has been asked to assist them in creating images, scenarios, futures history writing, and action plans for the future of the shopping areas in their towns.

The building that is currently occupied by the County Extension Office is being sold by the county. The County Extension staff will have to move to a new location, in another part of the county. Staff members are asked to create images of what they want the future to be in the new location. The staff hopes that the process will contribute to making the move more positive by focusing on what can be done, rather than focusing on having to move.

A 4-H staff that is working on youth unemployment wants new approaches to helping youth anticipate what their lives will be like, given various educational options and career paths. The staff is creating an imaging process that can be used with youth to help them focus on career exploration.

The technique of imaging is not recommended to be used by itself, but in conjunction with other techniques. It is especially useful as a beginning technique, followed by scenario building and futures history writing.

Scenario Building

The terms ''scenario'' and ''futures'' often are mistaken for one another. Granted, the purpose of any futurist endeavor is to glimpse what lies ahead, and, as such, it depicts a scenario of sorts. As used here, however, the term ''scenario'' will have a much more specific meaning. As defined by Wesch and Watson (1979, p. 126), a *scenario* is ''a hypothetical outline of a series of events as they might logically be expected to develop.'' Scenarios are disciplined and structured judgments, as to the course of possible futures, that describe structurally different future environments. They are focused views of the future, geared to the needs of specific decisionmaking, i.e., alternative images of the way the future could materialize. Scenarios can be prediction or prevention tools, if they help to uncover some insight into events that might otherwise be overlooked (Ehrlich, 1973). They are explicitly designed to deal with the interconnections among social, economic, political, and technological forces. They can show the ways in which the ''micro-environment'' might be affected by different ''macro-futures''—the broad sweep of societal forces (Wilson, 1978).

Scenario building can result from specific elaborations of situations projected through the use of the trend extrapolation technique described in Unit III, ''Projection and Forecasting.'' A scenario also can be the product of a fertile imagination and a creative vision that emerges from the process of imaging. The Delphi technique has been used to generate scenarios, as has the cross-impact analysis technique. One complex version entails developing a number of different scenarios in different disciplines that, in turn, can be modified and ultimately synthesized into one (Chandler and Cocle, 1982). For example, if a Native American tribal community college is being imaged, economic and fiscal, curriculum, architectural, and political scenarios could be developed and then synthesized into one. Achieving a single scenario would require going back over each separate scenario to reconcile or make adjustments to what is incongruent or incompatible with the whole.

Scenario building is the inventing of new ways of being, doing, feeling, and thinking; new programs and practices; new cultural forms; and new institutions and organizations, policies, resources, and instruments of action. Scenario building helps us "try on" our projections, proposed actions, and focused images for size and feel. Through scenarios, we can make a design or several alternative designs and rehearse their operation. Scenarios provide us with an instrument for learning (Ziegler, 1982a).

A common concern of those who are building scenarios is their plausibility. Some scenarios may, at times, be difficult to tether to the reality of the present. On the one hand, what is required is to let the mind and the imagination loose. On the other hand, the creator must never "cut the cord" to reality, if the outcome is to be deemed plausible.

Scenario building has proved to be one of the main tools of futures studies (Schwarz et al., 1982). It can help us to create holistic views of the future. It can allow us to anticipate possible problems; highlight alternative modes of action; and facilitate numerous "what if?" games.

Purposes of Scenario Building. The purposes of scenario building (detailed descriptions of the future nature and scope of unfolding potential events, objects, and processes) are (1) to identify an alternative hypothetical series of events or products that could possibly materialize; (2) to test the way the parts fit together; (3) to develop insights into events that might otherwise be hidden; (4) to discover interconnections among events and forces; (5) to note the potential effects of macro-events on micro-environments; and (6) to contribute to specific decisions in the present.

Procedures. The basic steps outlined here for scenario building are a combination of those suggested by Wilkinson (1983) and those of Ziegler (1982a):

1. Set forth a clear, bold, vigorous goal statement for the image or general vision of the future. This statement describes a not-yet-occurred state of affairs that the scenario builder proposes to bring about, something that ought to be done or brought into existence. Do not limit the goal statement to what is practical, feasible, fundable, or safe. The scenarios will reveal those limitations.

2. Imagine the indicators that tell the scenario builder that the goal has been achieved. One helpful way to do this is to move imaginatively into the future; make it present; and live it. This transference enables the scenario builder to identify behaviors, practices, organizations, and settings, each with specific details that can anchor the goal statements so others can tell when goals will have been achieved.

3. Reflect on and specify the assumptions that underlie the image, proposed intervention, or plan. Describe the rationale that justifies it; identify the values that are expressed in it; and consider competing values.

4. Describe the persons or groups that must or will be involved. Identify those who are affected (benefited, hurt, influenced, changed, ignored); the implementors (professionals, technicians, financiers, supporters, employees); and the policymakers and decisionmakers (family members, citizen groups, public officials, administrators, employers). In some scenarios, the elements in the physical ecological system must be identified.

5. Identify the decisions to be addressed in the planning process. These decisions define "what it is" about the future that scenario builders would like to know, and so become the focus for the scenario. Often, decisions have to do with which approach provides the most benefits or results with the least harm; how much should be undertaken; where and when something should occur; or which sequence of development is best.

6. Describe the strategies, means, methods, tools, instruments, or equip-

ment that will be needed to achieve the goal.

7. Select several logics that will give coherence to the scenario and result in structurally different views of the future. For example, one scenario on workplaces of the future might "assume" extensive growth in information technology. Another scenario on future workplaces might "assume" severe energy shortages. Creating alternative scenarios for key decision alternatives will provide an opportunity to explore the potential consequences of these key decisions. This is the key step in the whole scenario-building process, and can be achieved by (1) focusing, first, on those key forces that represent the maximum degree of criticality and uncertainty; and then (2) ascribing alternate logics that explain why and how these selected forces might take different trajectories. We can think of these as being different "theories of how the world works."

8. Elaborate a set of scenarios (typically three to five) based on these driving forces and logics. For each scenario, describe how all the relevant macro-environmental forces and decision factors might be affected by the prevailing conditions of that scenario. This means figuring out what might happen as a result of successful implementation of a goal under the limitations of each alternative scenario.

9. Identify the decisionmaking implications of each scenario, i.e., the potential opportunities and threats to be weighed in making the decision. This also means identifying unanticipated consequences, effects, and impacts, and the potential scope of them for specific groups: those identified in the initial steps to this process. Since not all consequences are neutral, special attention must be paid to those who might be harmed or who might oppose any effort. It may be helpful to assign a positive (+) or a negative (-) symbol to each consequence for each constituency or person involved or affected.

Scenarios are most helpful in identifying a broad range of forces and potential consequences that should be considered before initiating serious efforts to implement an image or a plan.

One last word: a sense of ownership is important if scenarios are to be useful in the long-range planning process. Participants need a significant amount of time to develop their scenarios, if this technique is to be related to key decisionmaking.

Futures History Writing

Futures history writing, as a technique, was created by Ziegler (1982a) to assist participants in futures-invention to make a transition from the scenarios they have created to action plans. Futures history writing is a way to connect the future with the present through identifying the

Scenario Building Example Situations

A dairy association has asked the Extension Dairy Specialist to help the members think through their recommendations on land use to those farmers who have retired their herds through the "buy-back" program. They want to know what their options for the future are, and what the picture would be if they used some of their land for vegetable crops or other purposes. The Extension specialist suggests that they create alternative scenarios for different types of situations.

Tobacco farmers, faced with a declining market, were concerned about what their future will look like. Their Extension Vegetable Crop Specialist is helping them create scenarios for their future, based on different crop decisions.

necessary linkages that will have to be made to realize the operation of a specific scenario.

The technique of futures history writing builds on the concept of the "future present moment," the capacity to put ourselves into a specific time and place in the future, and to live that future as if it were the present. Through imagination, the intended future has happened. While standing firmly (mentally) in that future place and time, a question is asked: "How did all of this [the scenario] come about?" or "How did it happen?" This technique provides a vantage point of looking backward to the present to find out what happened to bring about an intended future. By evoking an imaginary memory, a multiplicity of events and a wide array of alternative pasts are brought into consciousness.

What will be "remembered"? The content of our memories is quite specific: happenings, specific instances, milestones, stages of development, breakthroughs, changes, discontinuities, and so on, in cultural, scientific, political, economic, intellectual, and personal areas. These events are sorted in a logical sequence and written as a record for specific time periods. This technique is a special form of imaging and requires the application of the 10 rules that were listed as a part of the content on "Images and Imaging."

Purposes of Futures History Writing. The purposes of futures history writing are (1) to generate conscious awareness of the wide range of events and happenings that are likely to link the intended future image or scenario to the present, and (2) to view these in some ordered, sequential stages of development.

Procedures. The procedures for futures history writing include the following eight steps:

1. Participants place themselves, through imagination, at a specific point in time in the future to live a scenario or intended image of the future as a "future present moment." From this stance, they ask, "How did it happen?"

2. Participants compile, through the use of their imaginary memory, a long list of specific concrete instances, events, happenings, milestones, stages of development, breakthroughs, changes, or discontinuities in cultural, scientific, political, economic, intellectual, and personal areas that might have contributed to the imagined future.

3. Participants record the items from their memory search into a plausible sequence, as a historical record, in which are identified milestones for each of up to seven time periods of four or five years each.

4. Participants review the futures history document for discontinuities and gaps.

5. Participants return to imaging, when necessary to create new material for making adjustments and additions.

6. Participants share their futures history documents with others, and receive feedback from careful readers.

7. Participants collaborate in creating futures history documents for scenarios that contain common interests and concerns.

8. Futures history documents then are used as a springboard for specific action planning.

The process can be repeated for alternative scenarios or images of the future to test their desirability, plausibility, and feasibility.

Action Planning

All of the information generated through using the techniques described in this Module should be viewed as part of efforts to analyze situations and to take steps toward action. The contents of **Module 4: Situational Analysis,** and **Module 2: The Extension Education Process** provide a broad framework for action planning on the part of indivi-

Futures History Writing Example Situations

The Cooperative Extension staff development office has decided to conduct seminars for all employees who are within 10 years of retirement. These seminars are intended to assist employees in making present decisions regarding retirement possibilities, so that transitions can be positive. The seminar leaders intend to use futures history writing as one of the seminar techniques.

A community youth center has been scheduled to close due to lack of funds. Members of the 4-H staff, concerned about the impact of the closing on future programs and activities for youth, have called a meeting of youth-serving agencies. At the meeting, they want to begin a process of imaging, scenario building, and futures history writing regarding what they want to happen.

duals, families, groups, organizations, and, in some cases, whole communities. Action planning also is part of the public policy education process described in **Module 6: Education for Public Decisions.** Learners are encouraged to review that process and to consider ways that each of the techniques for viewing the future, described in this Module, contribute to it.

In addition to the action-planning techniques mentioned in Module 2 and Module 4, several techniques that have been used specifically with futures-invention approaches to view the future are mentioned here. Ziegler (1982b) describes action planning as a set of exercises that enable the futures-inventor to respond intelligently, knowledgeably, and with commitment to the question: "How may we best begin to live our intended futures in the present?" or "What can we begin in the here-and-now that will move us toward and into those futures?" Ziegler suggests that setting short-term objectives, identifying action groups, analyzing enhancers and inhibitors, identifying resources, and designing instruments and action are essential steps toward achieving intended futures. Each of these action-planning steps is presented briefly.

Setting Short-Term Objectives. Cooperative Extension used to plan its program objectives on a year-to-year basis. More recently, the emphasis has shifted to setting objectives for major program plans of work on a four-year or five-year basis. According to Ziegler (1982b), a future planning period of five or fewer years is considered short-term for setting program objectives.

What are these objectives? They are not-yet-occurred states of affairs that, when undertaken, describe the practices, organizations, institutions, interpersonal contexts, and so on, that bring to life the various aspects of the images in the scenarios. Learners are encouraged to look into their images, their scenarios, and, most important, their futures histories to locate "do-able" components that need not wait 20, 30, or 40 years for their realization. As they go through the other steps, participants are to keep in mind that the first statement of objectives may be modified. There is a creative tension between the present contingencies and the intended future.

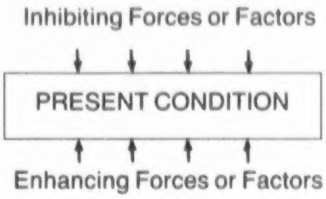
Participants are to describe short-term objectives in detail, with concreteness and specificity. Action settings, the spaces where something can get done to achieve these objectives, also are specified. A full description of an action setting includes references to beliefs, values, costs, payoffs, key roles, and systems of rewards and incentives. Appropriate short-term objectives also can be derived through considering the membership, employment, kinship, ethnic, and credential aspects of an action situation.

Identifying Action Groups. Identifying action groups, the second step in action planning, begins with the question: "Who are the main actors in one's images and scenarios, in futures histories, in short-term objectives, and in action settings?" or "Who are the persons, groups, organizations, and institutions involved in the action and movement?"

Ziegler (1982b) states that there are, first, groups of persons who are to be influenced or changed in ways specified in the short-term objectives. The second group consists of persons, groups, and organizations that effect the new policies, programs, and initiatives. These entities undertake the actions that bring about the short-term objectives. Their willingness and ability to carry out the action plan in question may well determine its success or failure. The third group consists of decisionmakers. These persons may overlap with the first two groups. Their approval is necessary to initiate the actions called for in the action plan. They may be the policymakers, citizens, organizational leaders, elected or appointed officials, and so forth. These persons or groups are to be specified, along with their interests, their characteristics, and their relevant systems of sanctions and rewards.

Analyzing Enhancers and Inhibitors. Kurt Lewin (1947) proposes that social or interpersonal conditions can be viewed as the balance between facilitating and restraining forces. He suggests that, if we weaken the restraining forces, we "unfreeze" the status quo, and the facilitating forces then can move us toward our goals. This approach (force-field analysis) requires identifying the forces, and then selecting those we can influence. Ziegler (1982a) expands on this idea, and applies it to the analysis of futures-invention goals.

A force-field analysis (depicted in the schematic), in which the different arrows that represent forces or factors are labeled, is a good learning tool. The direction and length of the arrows can show how relevant forces need to be changed to "unfreeze" a situation. This leads to discussion of the resources and actions needed to do so.



Ziegler suggests that, in the final analysis, successful action planning depends upon the correct identification of the factors that enhance or inhibit the entire action process and movement. These factors are the "levers" or "pry points" for effective action. To identify these forces, Ziegler suggests that learners and planners look to themselves to identify the enhancers and inhibitors to action. Another way to identify forces is to review the identified action groups, and to specify the factors that may hold back support from each. Scenario building exercises are likely sources of factor identification. The same underlying factors for each scenario are probably at work across different time frames. While this analysis proceeds, keep in mind that the objective of action planning is to neutralize the inhibitors and encourage or "free" the enhancers so that they can be brought into play.

Resource Identification. What are resources? Ziegler (1982a) states that resources are energy—human or otherwise—that can be marshaled to achieve a goal. He believes that the most important forms of human energy are in plentiful supply. The problem is not one of scarcity, but one of involvement of key action groups and the release of human potential that can occur when common concerns are identified. When viewed this way, resource identification becomes a task of specifying the competencies called for to reduce inhibitors and to strengthen enhancers. Identify persons, role, organizations, institutions, and the actions they can and will perform as resources for the movement toward one's intended future.

Designing Instruments and Actions. Instruments and actions are ways of delivering resources to the point of movement toward the intended future. Ziegler (1982a) believes that the militaristic language of strategy and tactics, often used in action planning, tends to describe the human actors as manipulable objects. He suggests an approach in which persons of all types, and their groups and organizations, are invited, encouraged, and enabled to design new actions and practices appropriate to common visions of the future.

The purpose of designing instruments and actions is to enable participants in the futures-invention and scenariobuilding process to begin present steps toward their intended futures.

The action-planning process consists of the following steps (Ziegler, 1982b):

1. Set short-term, detailed, concrete objectives that describe movement toward intended futures, and that are specific to action settings (environment where something can be done to achieve the objectives).

2. Identify action groups (those who are influenced; those who carry out policies, programs and initiatives; and those who make decisions) necessary to initiate action toward intended futures.

3. Identify and analyze enhancers and inhibitors (forces or factors that affect the entire action process), and select those that can be influenced by participants.

4. Identify resources by naming persons, roles, organizations, institutions, and the actions that each can and will perform for movement toward intended futures.

5. Design instruments and action plans by stating clearly who does what, to or for whom, under what conditions or circumstances, with what resources, for what purposes. In addition, to whom, what, and how does accountability occur, what types of evaluation instruments will be used?

Summary: Invention and Creation Techniques

The underlying assumption of all the invention and creation techniques for viewing the future is that one begins by envisioning a goal or future state toward which human effort is directed. The present reality is viewed as tethered to the future, rather than the reverse. Invention and creation approaches invite us to expand our choices, raise our aspirations, and experience the motivation for positive action that imaginative possibilities can bring. Through eliminating obstructive thinking, brainstorming, and reflecting on preferences and values, positive goals that attract motivation are created. Invention and creation techniques for viewing the future depend on the capacity to create clear, guiding visions of an intended future.

The invention and creation techniques include preference surveys, values audits, images and imaging, scenario building, futures history writing, and action planning. Taken together, these techniques provide specific procedures that can be used with individuals, families, groups, and organizations to invent and initiate action toward preferred futures. Cooperative Extension's role in the use of invention and creation techniques is that of a facilitator of processes that free persons, groups, organizations, and communities to hope and dream of a future that is worth achieving, and to assist these publics in taking action that moves them in the direction of that achievement.

Unit VI. On Selecting Techniques for Futures Perspectives

Selecting the appropriate technique for a specific situation is one way of assuring that Extension's publics will benefit from their attempts at generating future perspectives. It is not our intention here to list every possible situation in which a particular technique should be used. Rather, we will provide some guidelines to help you select appropriate techniques. There are few situations in which the appropriate methodology is immediately apparent.

We do not wish to encourage Extension professionals to become ''specialists'' in only one or two futures perspectives techniques. Techniques can be adapted and altered. Moreover, techniques are most likely to be helpful when used in various combinations and in alternative sequences.

What to Consider When Selecting Futures Perspectives Techniques

Several important variables should be considered when choosing among the various futures perspectives techniques described in this Module. These variables are (1) purpose, (2) problem characteristics, (3) the nature and extent of available information, (4) the scope of the problem, (5) the problem's urgency, (6) the time period involved, and (7) the level of participant commitment.

Purpose for Using a Futures Perspectives Technique

Here we must decide why we want to use a technique to assist our publics in generating futures perspectives. Pertinent questions we might raise are:

- Do we wish to help people in the situation anticipate and learn about the future?
- Does the group need to forecast future trends?
- Does the group need to identify the future risks and impacts of a proposed plan or action?
- Does the group need to be inspired through the invention and creation of new visions of the future?

The techniques presented and described in this Module are organized according to the four main purposes of (1) anticipation, (2) projection, (3) prevention, and (4) invention. Some situations may require only techniques associated with one of these purposes. Other situations may require a planned sequence of several techniques, as our publics become more comfortable with the concepts of generating futures perspectives. Also keep in mind that techniques that are primarily used for one purpose sometimes can be adapted to a second purpose. For example, scenario building can be used for projection and prevention, as well as invention purposes.

Problem Characterization

Another thing to consider in selecting techniques is the nature of the problems we see posed by our situations. Some problems are simple. Others are quite complex. Quantification may be easy in some situations, but difficult in others. Some problems have known solutions; others have defied human logic, so far, and have no known solutions. Some problems are rooted in physical conditions; others are the result of value conflicts among various groups.

When selecting techniques for futures perspectives, think about each technique's usefulness for each specific problem situation. For example, forecasting techniques work best for problems that are rooted in physical conditions or observed transactions, and that can be quantified. Problems centered on potential physical risk may require measurement techniques and projections based on laboratory evidence or historical precedent in similar situations. Invention and creation techniques, on the other hand, are appropriate for ambiguous and "unsolvable" problems, and those in which value conflicts are present.

Nature and Extent of Available Information

Once we have established our purpose for using a technique, and determined the nature of the problem confronted, we should consider the information that is available. How much information is available? What does it tell us? Is this information accurate or reliable? Are there case studies that we can use? Is there a historical precedent? Are data quantitative or qualitative? What types of data do we need to collect? Can we collect data that may show regularities across the past, or are we limited to data from unique situations? Is it possible to identify a trend? Must information be generated or created? These questions help in selecting techniques for futures perspectives. For example, if we have access to extensive records, we may want to use a trend extrapolation, or consider seeking help in the use of a computer model. In situations where data are scarce, more qualitative techniques, such as Delphi, imaging, or scenario building, can be employed. Thus the information that is available will determine, in part, the technique(s) to use in a given situation.

Scope of the Situation

The scope of the situation is another important consideration in selecting techniques. In thinking about the scope, ask whether we are describing a situation for an individual, group, organization, community, nation, or the whole planet. As we have seen, some techniques created for use with organizations can be modified for use with groups or individuals. Some techniques, such as computer modeling, require resources that are not available to individuals or small groups. Other techniques, such as imaging, scenario building, and futures history writing, are applicable to individuals, as well as to organizations and communities.

Urgency of the Situation

We also must take into consideration the urgency inherent in a particular situation. Some techniques, although desirable, may require more time than can be afforded before decisions must be made. More often, the sense of urgency is due to dissatisfaction with a situation. Although urgency may be a motivator for participation, it is not necessarily conducive to generating quality futures perspectives.

Time Element

Some techniques for futures perspectives are best for the near future and others for the more distant future. Forecasting techniques are most accurate for the near future. Prevention and adaptation techniques are conducted for near as well as distant future impacts. The invention and creation techniques also can be used for near as well as distant time frames.

Level of Participation

Selection of techniques for futures perspectives also will depend on potential participants' level of commitment to participate and take action. Do participants give the task a high priority? Do they believe that they can influence the future? Will they have a sense of ownership of the process? Participants may believe that some techniques are too difficult for them to undertake, or require more time and resources than they are willing to invest. They may be intimidated by some of the techniques. The invention and creation techniques are included in this Module because they do not require specialized technical skills. They can be undertaken by most persons who are willing to invest time and commitment.

Summary: Techniques for Futures Perspectives

The conceptualization behind the content of **Module 7: Techniques for Futures Perspectives** is based on the four alternative purposes for generating futures perspectives:

- To awaken us to the necessity and benefits of learning to think with a futures orientation;
- To examine the implications of future trends and projections for our activities;
- To prevent undesirable, hazardous, or unintended outcomes by identifying and understanding the potential consequences and risks of practices, developments, and proposed policies; and
- To invent, create, and focus new visions, possibilities, and goals for a desirable or preferred future that will motivate activity and attract resources.

These four purposes have been titled, respectively, *Anticipatory Learning*, *Projection and Forecasting*, *Prevention and Adaptation*, and *Invention and Creation*. Learners will differ in the importance they place on each of these purposes. We believe that these four approaches have a place in Cooperative Extension's role in viewing its own future and in assisting its publics in generating futures perspectives.

The four approaches to futures perspectives are distinct, yet complementary. They should be viewed in relation to each other, not in some hierarchy or preferred sequence. It was difficult for us to decide the presentation sequence in the Module, because there is no single approach that ought to go "first." We feel most comfortable in viewing the purposes as shown in Figure 1.

After analyzing a number of situations that came to our attention when we interviewed Extension personnel regarding the potential usefulness of the techniques in this Module, we recommend a mix-and-match approach to the selection of techniques, depending on each situation. We believe that the creative combining and sequencing of techniques is most desirable.

The techniques for generating futures perspectives can be used to help clarify Cooperative Extension's own future mission and direction at this critical point in its history. In addition, these techniques can provide a basis for Cooperative Extension to assist its publics to become futures-oriented and to take a proactive stance toward the future, rather than merely reacting to problems and needs as they become apparent. It is our hope that the introduction of **Module 7: Techniques for Futures Perspectives** will be one ingredient that will occasion this development.

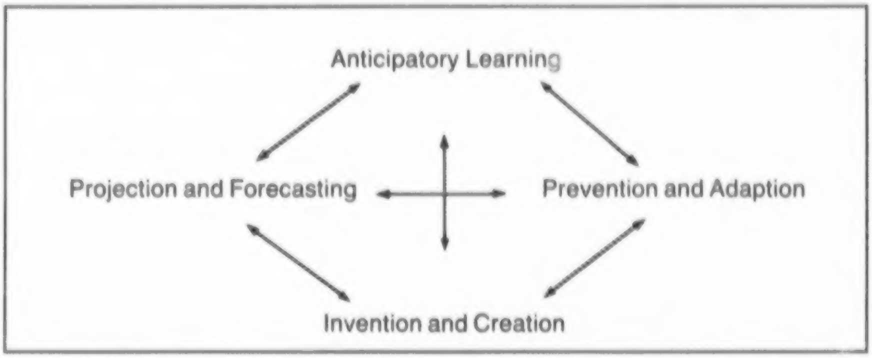


Figure 1. **Model of conceptual relationships among alternative purposes of techniques for futures perspectives**

Selected Annotated Bibliography

Armstrong, Scott J. 1978. *Long-Range Forecasting: From Crystal Ball to Computer.* New York: John Wiley and Sons.

Armstrong writes for those who are engaged in long-range forecasting. A detailed description of theories, methods, techniques, and ideas, this book is intended for both experienced and novice forecasters. The author has provided a basic reader's guide to this very "readable" book.

Ascher, William. 1978. *Forecasting: An Appraisal for Policymakers and Planners.* Baltimore, Md.: Johns Hopkins University Press.

The author examines the nature of forecasting and issues surrounding it. Population, economic, energy, transportation, and technological forecasting are discussed in depth. The focus is on the impact rather than the accuracy of forecasting. Ascher presents his own theories and hypotheses concerning characteristics of the practice.

Ayers, Robert U. 1979. *Uncertain Futures: Challenges for Decisionmakers.* New York: John Wiley and Sons.

Ayers considers the nature of forecasting, its interrelated components (e.g. sociopolitical, technological, ideological), and the need to address each equally. Methodological issues are discussed. Finally, Ayers develops three alternative future scenarios, and examines the global ramifications of each.

Cam, Joseph J., and B. Harrigan. 1984. *Yesterday's Tomorrows.* New York: Summit Books.

The book is based on a Smithsonian Institute exhibit of past images and fantasies about the future. It is a highly visual history of futures imagings in the United States since the late nineteenth century. A retrospective look at scenario building.

Coates, J. 1978. "Technology Assessment." In J. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

Coates reviews and assesses methods and techniques of technology assessment. In technology assessment, the effects of technological change on society are examined and evaluated. Practical considerations of various procedures are presented.

Dede, C. 1978. "Technology and the Future." In J. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

Dede summarizes and reviews the several schools of thought on technology and their role in futures research. He stresses the role of technology as a force in shaping the future. Impacts of technological change must be evaluated both quantitatively and qualitatively. In this way, options can be clarified, and decisionmaking can be facilitated. Reducing uncertainty in decisionmaking on potential consequences of technology is essential, and quality technology assessment research can help to do this.

Duke, R. D. 1978. "Simulation Gaming." In J. Fowles (ed.), *Handbook of Futures Research.* Westport,Conn.: Greenwood Press.

Simulation gaming involves participants in literally creating alternative conceptual maps and directions that belong to the future. Duke provides an overview of specific speculations and ramifications about the future. Simulations provide a rational, safe, yet comparatively free and spontaneous way to explore decisions. An example is provided.

Ferkiss, V. C. 1977. *Futurology: Promise, Performance, Prospects.* Beverly Hills, Calif.: Sage Publications.

The history, current trends, and potential directions of the study of the future are discussed. Pessimistic versus optimistic perspective of the global future are considered. The interdisciplinary nature of futures research is stressed. This book is for those who seek an overview of the field.

Fitch, R. M., and C. M. Svengalis. 1979. *Futures Unlimited: Teaching About Worlds to Come.* Bull. 59. Washington, D.C.: National Council for Social Studies.

This book is an introduction and guide to the teaching of futures in elementary and secondary schools. However, the ideas and techniques can be readily adapted for use with adults. An overview of various teaching methods and detailed examples of most methods are included. An annotated bibliography of resources for futures education is listed at the end of each chapter.

Fowles, J. 1978. "The Problem of Values in Futures Research." In J. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

The nature of futures research is inherently narrative. Many problems arise because current values are not necessarily those of the future and may, indeed, be at odds with them. A discussion of the nature of values is included, along with potential responses to current-future value conflicts. Futurists are cautioned to remember their own particular values explicitly as they engage in research.

Freeman, C., and M. Jahoda. 1978. *World Futures: The Great Debate.* London: Martin Robertson.

An overview of the futures debate, and the portrayal of four possible scenarios that could develop from the world situation of the 70s and 80s. In contrast to *The Limits of Growth* (Meadows et al., 1982), these authors believe that a desirable future is possible.

***The Future As an Academic Discipline. 1975.* Ciba Foundation Symposium 36. Amsterdam, N.Y.: Elsvier.**

Includes 11 essays on the role of the university in futures development written by British and American academics, with perspectives taken from their various fields. All address the university's role in planning. This book is for those who are specifically interested in the university's role in futures research and planning.

***Future Survey, 1979–present.* Journal of the World Future Society, Guilford, Surrey, England.**

Published monthly since 1979 by the World Future Society, this is the only generalist scanning service anywhere. It is nonpartisan, cross-disciplinary, cross-national, and is prepared for people who must get a broad view of trends and forecasts. The journal contains clustered abstracts, megatrends, highlights, and commentary, as well as an annual cumulation in *Futures Survey Annual.*

Gribbin, John R. 1981. *Future Worlds.* New York: Plenum Press.

Written for the University of Sussex, Science Policy Research Unit—SPRU, this book was designed to examine more carefully the optimal world future as described in a previous SPRU publication, *World Futures* (1978). In that work, four future alternatives were presented; in this, the desirable future of "high growth and more equality" is detailed. A scenario is constructed.

Harmon, W. W. 1976. *An Incomplete Guide to the Future.* Stanford, Calif.: Stanford Alumni Association.

Harmon projects an existent pattern of change and growth into the future. Included is a reader's guide to literature on trends and possible scenarios on the role of industrialized and nonindustrialized nations in future decisions.

Helmer, Olaf. 1983. *Looking Forward: A Guide to Futures Research.* Beverly Hills, Calif.: Sage Publishers.

Helmer, who was involved in the development of cross-impact analysis, the Delphi technique, and other projective measures, writes this book as a guide to methods of exploring the future. Various techniques such as scenario building and long-range forecasts, in addition to those previously mentioned, are examined. Application of such generic techniques to long-range planning is presented. The volume is intended for use by planners, students, and researchers. It is detailed and thorough.

Hill, K. 1978. "Trend Extrapolation." In J. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

Trend extrapolation is frequently used for forecasting in futures research and planning. The nature of a trend and the principal techniques of trend analysis, along with their strengths, weaknesses, and applications, are considered in this chapter. The problem of causality upon which trend analysis is based is discussed. Rules for the design of trend extrapolation conclude this chapter.

Johnson, D. 1978. "Social Indicators and Social Forecasting." In J. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

Quantitative social indicators are trend measures that register society's movement toward a given goal. Social indicators are useful in social forecasting, provided the indicators are both normative and descriptively accurate. Their use is of much broader scope than technological forecasting measures.

Jones, R. (ed.). 1981. *Readings From Futures.* Guilford, Surrey, England: Westbury House.

Jones presents a collection of articles included in *Futures,* 1974–1978. He identifies the works of authors he judges to be the best in futures writing. Concepts, theory, issues, applications, and solutions are considered by the different authors.

Laslo, Ervin.1974. *A Strategy for the Future.* New York: G. Braziller, Inc.

In this book, Laslo begins to examine the parameters and contours of a desirable world order. The book serves as an introduction to a systems approach to future development on a global scale. An optimal scenario and the means to achieve it are developed.

Lerenbach, Hans, and James P. Cleary. 1981. *The Beginning Forecaster.* Belmont, Calif.: Lifetime Learning Publishers.

The techniques of forecasting through data analysis are introduced and presented in detail. Various models and tools are described. Finally, the process of implementation is considered. Specific readings and practical suggestions are included for each aspect of the forecasting process. It is a pragmatic approach and a useful resource for the forecaster.

Linstone, H. A., and W. H. Clive Simmonds. 1977. *Futures Research: New Directions.* Reading, Mass.: Addison-Wesley.

New Directions is a collection of essays by leading international authors in the field. Each critically assesses some aspect of what he or she views as a correct process and direction of futures research, and then directs the reader to a new, different pathway. All stress a growth away from mathematically based, objective, analytic approaches toward more creative, subjective, qualitative modes. A wide variety of perspectives, from philosophy to mathematics and ecology, guide the authors.

Livingston, D. 1978. "The Utility of Science Fiction." In J. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

Science fiction has a significant role to play in futures studies, for it represents an effort to combine scientific futurist thinking with creativity and imagination. Methods, content, and social impact of science fiction are analyzed in terms of their effect on the field of futures research.

Loye, D. 1978. *The Knowable Future: A Psychology of Forecasting and Prophecy.* New York: John Wiley and Sons.

Loye presents the general reader and the specialist with an introduction to the field of futures psychology and its techniques. Information on the methods and procedures of forecasting, and its roles and usefulness, is provided. The author writes for a variety of audiences: student to practitioner. Concepts, methods, applications, and theories are discussed.

McHale, J. 1978. "The Emergence of Futures Research." In J. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

An overview of the development of futures tradition in the West. Events and ideas pertinent to the direction of the futures trends are noted. Current activities and approaches in the field are summarized. Potential effects of the emergence of futures thinking on the present, and vice versa, conclude the discussion.

McHale, John, and Magda C. McHale. 1977. *The Futures Directive.* Boulder, Colo.: Westview.

This book is an extensive compendium of international organizations and individuals involved in futures studies and long-range planning. Included are both those involved specifically in the futures field and those more generally working in the planning or the formulation of long-term policy. Outlined information is presented on each entry (organization). The book contains: type of work, methodology, time range, source of support, and for whom the work was done. Personal characteristics of key organization individuals also are included. Because the listings contain only the information from those who responded to a survey sent out by the Centre for Integrative Studies, SUNY, Binghamton, gaps do occur.

McLean, J. M. 1978. "Simulation Modeling." InJ. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

Mathematical simulation modeling as an approach to thinking about the future is introduced and evaluated. Basic concepts and rationale, practical utility, theoretical potential, and notable drawbacks are considered. This chapter is written for the novice, as well as for the expert who wishes to gain greater insight into this technique.

Marien, M. 1976. *Societal Directions and Alternatives: A Critical Guide to the Literature.* Lafayette, N.Y.: Information for Policy Design.

This guide to the literature describes what various thinkers believe is happening in our society. The annotated bibliography contains books on topics including: optimists and pessimists, ecology, the limits to growth, world order, decentralization, human needs, government reform, redistribution of wealth and power, and others.

Martino, J. 1978. "Technological Forecasting." In J. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

Technological forecasting represents the attempt to predict the types and degree of advancement of a particular technology through the use of quantitative methods. Various techniques are discussed, and guidelines for their application are included. Although technological forecasting as a scientific procedure tends to take little account of the contexts in which the technology occurs, it has considerable use in futures work.

Masini, Eleanora (ed.). 1983. *Visions of Desirable Societies.* New York: Pergamon Press.

This book contains several essays that are revisions of papers presented at the World Futures Studies Federation meetings in Mexico City in 1978 and 1979. Four main hypotheses and modes of thinking about the future were considered and developed by the group during those two years. The fruits of their work are contained in this volume. Alternative visions and societies are portrayed by each of the several authors included in the collection.

Mendell, J. 1978. "The Practice of Intuition." In J. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

The future, according to this author, resists highly deductive structured modes of investigation. Therefore, there is more reason to use intuition in futures research than in other disciplines. Methods for developing the inquisitive and creative cognitive skills necessary to futures research are delineated. Creativity, unbounded thought, and imagination have legitimate roles to play in futures research. The author recommends intuitive, nonrational, and nonsystematic approaches to the study of the future.

Michael, D. N. 1973. *On Learning to Plan and Planning to Learn.* San Francisco: Jossey-Bass, Publishers.

This author focuses on overcoming the resistance of organizations and individuals to long-range social planning. Michael, a social psychologist, introduces ideas on how to achieve broad participation in the social planning process.

Naisbitt, John. 1982. *Megatrends: Ten New Directions Transforming Our Lives.* New York: Warner Books.

Naisbitt identifies and discusses ten major trends that he thinks will affect the course of national and personal growth in the decades to come. His trend extrapolation is based on a qualitative analysis of mass print media. He intends this discussion to be a point of departure for personal decisions about one's own future. This book has been very popular with the general public.

Padbury, Peter. 1972. *The Future: A Bibliography of Issues and Forecasting Techniques.* Exchange Bibliography 279, Council of Planning Librarians. Waterloo, Ontario: University of Waterloo.

This bibliography was compiled for use in a series of courses entitled, "Ontario 2000—Alternative Futures," at the University of Waterloo. References include sources on forecasting techniques, general reading, and content-specific research on the future. Although dated, the bibliography represents a good starting point for research in the field.

Peccei, Aurelio. 1981. *One Hundred Pages for the Future.* New York: Pergamon Press.

Peccei outlines the development of what he calls human society's current critical stakes. Past and present are analyzed, and future linear trends are projected. Yet, Peccei believes that mankind has the ability to avert greater decline, and he suggests various essential means for doing so. Three essential elements of change—human revolution, politico-structural evolution of society, and increased global orientation—are examined.

Polak, F. L. 1973. *The Images of the Future.* San Francisco: Jossey-Bass, Publishers.

Western images and concepts of the future from various historical and cultural-theological perspectives are put forth. Polak then uses these ideas as a basis for developing new images of the future, images particular to humankind.

Raser, John R. 1969. *Simulation and Society.* Boston, Mass.: Allyn and Bacon.

This book is designed to introduce professional social scientists and students to simulation gaming techniques and theory. A survey of games is provided, with examination of their potential applications. Enough information is given about some simulation games to enable the reader to implement them. Games for policymakers are critiqued.

Sackman, Harold. 1975. *Delphi Critique.* Lexington, Mass.: The Rand Corporation and Lexington Books.

This study was designed and supported by the Rand Corporation, where the Delphi method was developed and initiated. A critical analysis and evaluation of the technique forms the body of the book. A semi-annotated bibliography on Delphi is included.

Schwartz, B., U. Svedin, and B. Wittrock. 1982. *Methods in Futures Studies: Problems and Applications.* Boulder, Colo.: Westview Press.

The authors examine methodological and philosophical issues involved in futures research. Three examples of futures studies conducted at the national level of policy and decisionmaking in Sweden are presented to highlight the various techniques, applications, and limitations of different research models. Guidelines for the conduct of future studies are developed. This is a good resource for those who want a practical application of various futures methods. The authors view mathematical models as planning devices to be viewed as "what if" or "learning" models.

Schwarz, Stephen. 1976. *Knowledge and Concepts in Futures Studies.* Boulder, Colo.: Westview Press.

Schwarz presents a collection of discussions on futures studies as activities and as bases for decisionmaking processes. Practical topics, such as forecasting techniques and long-range planning, are treated from a conceptual or theoretical framework. The 11 articles are useful for those involved in futures research at the academic level.

Sork, T. J. 1980. "Developing a Future Time Perspective: Variables of Interest to Educators." In K. M. Redd and A. M. Harkins (eds.), *Education: A Time for Decisions.* Washington, D.C.: World Future Society.

Different time perspectives and constructs are considered, and the role of the Extension agent or educator in fostering a futures orientation is detailed. This is useful background reading for those working in Extension.

Steal, G. Harry. 1983. *The Hopeful Future.* New York: Macmillan.

Steal uses trend analysis to make forecasts for a hopeful (long-range) future. He rejects the notion of a downward trend in human society's possibilities. Instead, he creates an optimistic vision of a future that is built upon communication technology. Finally, he presents a scenario of life in the early twenty-first century.

Stover, J., and T. Gordon. 1978. "Cross-Impact Analysis." In J. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

The authors present the limitations and complexities of this qualitative method of forecasting. They focus on interaction of variables along two dimensions in order to develop a model of the future.

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Development approaches, current research, and an example of cross-impact analysis are included. Strengths and weaknesses of the method are discussed.

Tester, F. J., and W. Mykes (eds.). 1981. *Social Impact Assessment: Theory, Method, and Practice.* Calgary: Kananaskis Centre for Environmental Research, University of Canada.

A comprehensive overview of social impact assessment, as seen by consultants, civil servants, planners, academics, and citizens. This book is the product of the first Canadian Symposium on Social Impact Assessment held in Banff, Alberta, Canada, in late 1978.

Theobald, Robert (ed.). 1972. *Futures Conditional.* New York: Bobbs-Merrill.

Photographs, cartoons, newspaper headlines, poems, essays, and scenarios of the future by various authors, ranging from Ray Bradbury to Bertolt Brecht, are collected in this very enjoyable introduction to futures. Images of the future, materials about it, and ways for the reader to participate in imagining the future comprise the three parts of the book. This is a work designed to help the reader take an active role in thinking about and planning for the future.

Toffler, Alvin (ed.). 1972. *The Futurists.* New York: Random House.

A collection of essays by notable futurists, e.g., Olaf Helmer, Marshall McLuhan, John McHale, Margaret Mead, Herman Kahn, and Bertrand de Jouvenal.

Wilson, I. H. 1978. "Scenarios." In J. Fowles(ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

Scenarios are a useful tool in helping individuals imagine and focus on the future, for they provide a broad picture of what might be. The nature and purposes of scenarios are described; methods of scenario development are discussed; and examples are given.

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Working With Our Publics

Module 7: Techniques for Futures Perspectives

Leader's Guide

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Introduction

Purposes

The overall purposes of Module 7 are:

- To enhance the capabilities of Cooperative Extension professionals to understand and use techniques for generating futures perspectives as part of their educational planning; and
- To assist Cooperative Extension's various publics to know and use these techniques for generating futures perspectives.

Learning Objectives

The contents of Module 7 are addressed to Cooperative Extension professionals as the primary audience. It is anticipated that some Extension educators will, in turn, use this in-service material as a resource with Extension's publics as a secondary audience. As designers of this Module, it was our intention that, upon completion of the training, the participants will:

- Comprehend the educational role that Cooperative Extension can assume through the use of techniques for futures perspectives;
- Recognize and appreciate differences in time perspectives of cultures and age groups;
- Hold a broad overview of futures literature and representative techniques for futures perspectives;
- Value a future orientation and vision of Extension work, and be committed to using techniques to generate futures perspectives;
- Know the four complementary approaches for futures perspectives techniques: anticipatory learning, projection and forecasting, prevention and adaptation, and invention and creation.
- Recognize which techniques for futures perspectives can be useful for specific situations; and
- Be able to introduce, recommend, teach, and facilitate the use of techniques for futures perspectives to enhance the capacity of Extension's publics to influence future outcomes.

Overview of Contents

Preworkshop Assignments

The workshop will be most effective if participants prepare in advance. A preworkshop letter and packet should be sent to each participant one to two months before the workshop to allow time for the preparatory work. The packet should contain:

- A cover letter, welcoming learners to the in-service learning experience, along with three preworkshop assignments.
- Locally developed materials about the agenda, site, dates, and accommodations information.
- The Sourcebook, which contains the content of the in-service training, including a selected annotated bibliography and references on the subject.
- An article by Michael Marien, Handout 1: "Touring Futures II: A Literature Guide to Futures Studies for Cooperative Extension" (in Learners' Packet).
- Two self-assessment instruments: Handout 2: "Self-Assessment Instrument: Knowledge of Techniques for Futures Perspectives" and Handout 3: "In Search of Futurists: Futures Quotient (FQ) Self-Assessment Instrument," by M. Q. Patton. These instruments are in the Learners' Packet.

The following is a sample letter you may wish to adapt for your own use.

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Sample Cover Letter to Workshop Participants

Dear Extension Colleague:

We are delighted that you have enrolled in **Module 7: Techniques for Futures Perspectives**. The enclosed packet of materials contains information about accommodations, site, general information, dates, meeting times, and materials needed for workshop preparation. This letter will give you an overview of the workshop's contents and the areas in which we would like your help.

The following three workshop assignments will offer you the chance to develop an in-depth overview of the workshop and to personalize the content.

Assignment 1: An Overview of Futures Literature

Please read the enclosed article by Michael Marien, "Touring Futures II: A Literature Guide to Futures Study for Cooperative Extension." This article will give you a brief glimpse of the vast array of futures literature. You may want to continue your self-directed learning by pursuing one or more of the books or articles listed in the article. During the workshop, we will discuss your responses to the article or articles you selected to read.

Assignment 2: Self-Assessment

There are two self-assessment instruments in your preworkshop packet. "Knowledge of Techniques for Futures Perspectives" and "In Search of Futurists: Futures Quotient (FQ)." The first provides a way for you to assess how much of the content of the workshop you already know, and should help you decide upon the area or areas in which you most want to expand your knowledge. "Knowledge of Techniques" will be used as a pretest and again as a posttest at the end of the workshop to help you realize how much you have learned. The second self-assessment instrument—"In Search of Futurists"—is an opportunity for you to reflect on your own orientation to the future.

Assignment 3: Prepare to Introduce One Technique to Other Participants

The Sourcebook is your textbook for the workshop. In it are described the purposes and procedures for each of the techniques for generating futures perspectives. Each participant in this workshop will be expected to read about one of these techniques prior to the workshop and to introduce that technique briefly to the other participants. You have been assigned the technique noted on the list of participants. You will have 15 minutes to involve the other participants in an initial introductionto this technique. We hope that you will use your imagination and creativity in this teaching assignment. We havefound that using a variety of Cooperative Extension professionals to introduce the Module's techniquesincreases participation, adds variety, and assists in identifying realistic applications for the techniques.

A Suggestion

If you have any questions about the three assignments, do not hesitate to contact a member of the workshop planning group, or me, as the workshop leader. Please be sure to bring your packet of preworkshop materials with you to the workshop, along with descriptions of situations familiar to you in which techniques for futures perspectives could be useful.

Attached is a list of workshop participants, their professional positions, and the technique each has been assigned to introduce.

Those of us who have planned this learning experience are looking forward to our being together for the workshop.

Sincerely,
Workshop Leader
Members of the Planning Group

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The Workshop

UNIT I. Techniques for Futures Perspectives: The content of Unit I emphasizes the importance of techniques for generating futures perspectives in the world today; Cooperative Extension's opportunity and role in the use of those techniques; the importance of involving the public in futures perspectives; incentives and purposes for generating futures perspectives; the educational objectives for Module 7; and an introduction to the four approaches to generating futures perspectives: anticipatory learning, projection and forecasting, prevention and adaptation, and invention and creation.

UNIT II. Anticipatory Learning: Unit II contains an introduction to the concept of anticipatory learning; a consideration of differences among personal time perspectives that affect orientations toward future study; an introduction to futures literature; a survey of future-oriented visual media materials; a consideration of fictional futures as an anticipatory learning aid; and a description of several future-oriented games and simulations. All of these programming ideas are intended to overcome resistance to viewing the future and to encourage anticipatory learning.

UNIT III. Projection and Forecasting: In Unit III, the usefulness of projection and forecasting approaches is emphasized; the limitations of forecasting techniques are cited; and the general sequence of steps for undertaking forecasts is outlined. Overviews are provided of futures research centers and sources of relevant computer software and on-line databases. Techniques for projection and forecasting are described: the Delphi, trend extrapolation, crossimpact analysis, and computers and their limitations as tools in forecasting.

UNIT IV. Prevention and Adaptation: Unit IV includes a history of impact or risk assessment and an introduction to economic, technological, environmental, and social risk assessment categories. An overview of purposes and procedures for these prevention and adaptation techniques is provided, along with a brief description of decision dilemmas associated with impact assessments. Finally, roles for Cooperative Extension in facilitating risk assessment efforts are suggested.

UNIT V. Invention and Creation: Generic approaches to invention and creation, including the elimination of obstructive patterns of thinking, as well as brainstorming and reflection approaches to identifying preferences and values are described briefly as an introduction to this unit. Techniques for generating futures perspectives that take an invention and creation approach include preference surveys, value audits, imaging, scenario building, futures history writing, and action planning.

UNIT VI. On Selecting Techniques for Futures Perspectives: The workshop is concluded with a discussion of what should be considered when selecting techniques for specific situations. Purpose, problem characteristics, nature and extent of available information, scope of the situation, urgency of the situation, the time element, and level of participation should be considered when selecting appropriate techniques for generating futures perspectives. Throughout the workshop, examples of situations in which techniques for futures perspectives could be used are presented, and learners are encouraged to consider possible combinations of techniques for these situations, or others they bring to the workshop from their local work settings.

Futures Posters

Posters, with printed quotations, placed around the room help to create an atmosphere that contributes to a futures orientation during the workshop. These posters are part of the Instructional Aids that accompany this Module.

Workshop Design

How to Use the Leader's Guide. In the Leader's Guide, we have drawn together several types of resources for the leader to use in organizing and planning effective in-service education sessions, or to encourage self-directed learning on the part of Extension educators. These resources include:

1. Suggested formats for each of the units.

2. Directions for suggested activities for each unit.

3. References for material in the Sourcebook upon which the leader may draw when leading discussions and giving mini-lectures.

4. Two self-assessment instruments: one on knowledge of techniques for futures perspectives and another on the extent to which the Extension educator holds a future orientation. Handout 2: "Self-Assessment Instrument: Knowledge of Techniques for Futures Perspectives" can be used as a pretest and can be included in the preworkshop learning assignment, or used during Unit I. The "Self-Assessment Instrument" also can be used as a posttest at the end of Unit VI. The self-assessment instrument for futures orientation is Handout 3: "In Search of Futurists: Futures Quotient (FQ) Self-Assessment Instrument."

5. References to learner handouts and TIP Sheets are included in this Guide.

6. Overhead transparencies are reproduced in this Guide in reduced size for the leader's convenience. A set of transparency masters is included in the Instructional Aids.

7. A videotape, "Tomorrow Starts Today," shows a variety of situations in which techniques for generating futures perspectives are introduced. The videotape is included as part of the Instructional Aids.

Assumptions and General Suggestions to the Leader. Module 7 is designed primarily for experienced Extension professionals at all levels of the organization. The content is presented in the preworkshop reading and a 12-hour workshop session. We recommend that the workshop be offered over a three-day period of four hours each day to allow learners time for additional reading and work between units. The organization of the content also lends itself to being taught as "mini workshops" on separate units or combinations of units. Some Extension professionals may prefer to work through the material as a self-directed learning project.

The Workshop Site. The Workshop requires a room large enough for the total group to meet together and for up to six small groups to form simultaneously. Separate break-out rooms work well, if they are available on-site. Dining and sleeping accommodations are excellent for convenience, efficiency, and a sense of community.

Equipment and Materials. The workshop requires an overhead projector and screen, several easels, newsprint flip charts, markers, tape, and a VCR with one or more color monitors.

The materials include: the Leader's Guide, preworkshop packets for each participant, including a Sourcebook; futures posters; the videotape, "Tomorrow Starts Today"; prepared handouts; transparencies; and TIP Sheets.

Staff. Although the Leader's Guide and Sourcebook provide introductory material adequate for most Cooperative Extension professionals to facilitate the workshop, it would help to select persons who have some professional experience in using some of the techniques described in the Module. A team-teaching approach has been used effectively. In addition, it is recommended that the workshop leader or leaders involve the participants by assigning them responsibility for introducing specific techniques.

Unit I. Introduction and Overview

Suggested Format

The activities suggested for Unit I and the time to be devoted to each are as follows:

Introduction of Participants (20 minutes)

Introduction to the Module: Overview and Objectives (10 minutes)

Videotape: "Tomorrow Starts Today" (45 minutes)

Example Situations for Technique Use (20 minutes)

Cooperative Extension's Opportunity and Role (15 minutes)

Self-Assessment Instrument Reflection (10 minutes)

Total time for Unit I—2 hours

Materials Needed

Sourcebook, Unit I

VCR and monitor and overhead projector

Flip chart or poster paper

Futures posters

Videotape: "Tomorrow Starts Today"

Handouts: 1 through 3 (preworkshop assignments)

Handout 4: "Glossary of Futures Study Terms"

Transparencies 1 through 9

3x5 index card for each workshop participant

Introduction of Participants (20 minutes)

Each workshop participant is asked to interview another participant in a dyad. After getting acquainted, each is asked to record, on a 3x5 index card, his or her partner's responses to the following questions:

1. What do you think Cooperative Extension will be like 20 years from now?

2. What situation with which you are familiar is most likely to require the use of techniques for futures perspectives?

When everyone has completed writing on the 3x5 cards, the cards are collected, mixed, and redistributed randomly. After giving their own names, participants are asked to read the card they received and to comment on it as if they were making a "Dear Abby" response. The leader indicates instances in which the content of the workshop fits the situations that participants have mentioned.

Introduction to the Module: Overview and Objectives (10 minutes)

Explain that **Module 7: Techniques for Futures Perspectives** is the last of a series of modules in *Working With Our Publics.* The total list of modules is shown in Transparency 1.

Explain that the modules can stand alone or be seen as an integrated program of professional staff development. The relationship between the other modules and Module 7 can be summarized as follows:

- **Techniques for Futures Perspectives** is the last module in the series, because it is designed for experienced Cooperative Extension professionals who have a grounding in the knowledge and skills of the other six modules.
- The techniques for generating futures perspectives taught in Module 7 do not stand alone, but make a special contribution to the overall program development process that Cooperative Extension uses with its many publics.
- The content of **Techniques for Futures Perspectives** builds upon the

**WORKING WITH OUR PUBLICS:
IN-SERVICE EDUCATION FOR
COOPERATIVE EXTENSION**

MODULE 1: Understanding Cooperative Extension—Our Origins, Our Opportunities:
David R. Sanderson
University of Maine, Orono

MODULE 2: The Extension Education Process
Richard T. Liles and R. David Mustian
North Carolina State University, Raleigh

MODULE 3: Developing Leadership
Lee J. Cary and Jack D. Timmons
University of Missouri, Columbia

MODULE 4: Situational Analysis
Laverne B. Forest
University of Wisconsin-Madison

MODULE 5: Working With Groups and Organizations
Betty L. Wells
Iowa State University, Ames

MODULE 6: Education for Public Decisions
Verne W. House
Montana State University, Bozeman
Ardis A. Young
Washington State University, Pullman

MODULE 7: Techniques for Futures Perspectives
J. David Deshler
Cornell University, Ithaca, New York

TM-1

content and skills taught in **Module 4: Situational Analysis,** and adds techniques that can be used to anticipate the future, in addition to describing the present.

- The techniques that are taught in Module 7 can be applied in their simplest and most general form to Cooperative Extension's own organization, as well as to individuals, families, groups, organizations, and in public policy decisionmaking situations.
- Some of the information generated through the use of techniques learned in Module 7 contributes to the process taught in **Module 6: Education for Public Decisions.**

Ask the learners:

1. Why is it important for members of society, Cooperative Extension's publics, to be involved in generating futures perspectives?

2. Should this activity be left to the futurists and the experts?

Provide a mini-lecture or lead a discussion on various reasons for the use of techniques for generating futures perspectives. Unit I of the Sourcebook (''Cooperative Extension's Opportunity and Role'' through ''Approaches for Generating Futures Perspectives'') can be used as the basis of this mini-lecture or discussion. Points may be summarized by using Transparency 2.

**WHY THE PUBLIC SHOULD
GENERATE FUTURES
PERSPECTIVES**

- RIGHT OF ACCESS TO INFORMATION
- CONTRIBUTE TO PLANNING
- PROTECT PUBLIC INTERESTS
- CREATE AN INFORMED PUBLIC
- ENVISION FUTURES

TM-2

Present the purposes and learning objectives for Module 7 (Sourcebook, ''Purposes'' and ''Educational Objectives'') using Transparencies 3 and 4.

**PURPOSES OF MODULE 7:
TECHNIQUES FOR FUTURES
PERSPECTIVES**

1. TO ENHANCE THE CAPABILITIES OF COOPERATIVE EXTENSION PROFESSIONALS TO UNDERSTAND AND USE TECHNIQUES FOR GENERATING FUTURES PERSPECTIVES AS PART OF THEIR EDUCATIONAL ACTIVITIES.

2. TO ASSIST COOPERATIVE EXTENSION'S VARIOUS PUBLICS TO KNOW AND USE THESE TECHNIQUES FOR GENERATING FUTURES PERSPECTIVES.

TM-3

OBJECTIVES FOR MODULE 7: TECHNIQUES FOR FUTURES PERSPECTIVES

- COMPREHEND COOPERATIVE EXTENSION'S ROLE.
- GAIN A BROAD OVERVIEW OF FUTURES LITERATURE.
- VALUE A FUTURE ORIENTATION TO EXTENSION'S WORK.
- APPRECIATE DIFFERENCES IN TIME PERSPECTIVES.
- KNOW THE FOUR APPROACHES TO FUTURES PERSPECTIVES.
- RECOGNIZE APPLICATIONS OF TECHNIQUES FOR SITUATIONS.
- INTRODUCE, RECOMMEND, AND FACILITATE TECHNIQUE USE.

TM-4

DEFINITION OF TECHNIQUES FOR FUTURES PERSPECTIVES

TECHNIQUES FOR FUTURES PERSPECTIVES INCLUDE ANY SYSTEMATIC ACTIVITIES OR PROCESSES THAT:

- INCREASE OUR MOTIVATION TO ANTICIPATE AND LEARN ABOUT THE FUTURE;
- IMPROVE OUR UNDERSTANDING OF TREND IMPLICATIONS;
- ALERT US TO ANTICIPATED CONSEQUENCES OF ACTIONS, PLANS, DECISIONS, AND POLICIES; OR
- ENHANCE OUR VISION OF A DESIRABLE FUTURE TOWARD WHICH OUR ACTIVITIES CAN BE DIRECTED.

TM-5

After you clarify participants' understanding and answer all questions regarding purposes and objectives, focus attention on a definition of techniques for futures perspectives. This definition can be presented by using Transparency 5.

You may want to explain the criteria for selecting content for this module, based on the following ideas:

Mini-Script: Criteria for Selecting Content for This Module

Since Module 7 is focused on techniques for generating futures perspectives, only that small segment of the futures literature that was relevant to methods or techniques was reviewed as source material. This meant ignoring material on the content or findings resulting from the use of methods, forecasts for specific problem areas, or interpretations and scenarios of the future.

Several criteria guided the selection of ideas and techniques for Module 7. The first is an emphasis on the creation of alternative ways of thinking, visualizing, imaging, valuing, and deciding to invest in the invention of alternative futures. Most major social and environmental issues require qualitative analysis along these lines as a prelude to selecting sometimes complex quantitative analytical methods. Although some of these complex methods may be required at times, Cooperative Extension's role as educator is more likely to assist its publics in alternative ways of viewing situations. Therefore, emphasis is not on complex statistical analytical techniques. Rather, we suggest that Cooperative Extension educators make use of the resources of land-grant institutions when these techniques are needed.

The second criterion is the importance of formulating appropriate questions and selecting approaches to match the questions or situations. Poorly focused questions make the selection of techniques and further analysis moot; the information generated irrelevant; and the resulting inferences

continued

invalid. Emphasis in Module 7 is on the use of methods and techniques for raising questions that are at the heart of situational analysis. These methods build on and supplement the content provided in **Module 4: Situational Analysis.**

A third criterion is the importance of human choice in the construction of alternative futures. Although historical, economic, social, structural, political, and cultural constraints should be acknowledged, lest the analysis degenerate into unsubstantiated utopianism, the emphasis in this Module is on the possibilities of human choice.

The techniques for generating futures perspectives, described in Unit I, are of two types: (1) those that Cooperative Extension professionals and their publics should know well enough to make appropriate judgments about the use of consultants; and (2) those that Cooperative Extension professionals and their publics can implement on their own as participatory research.

Present the four major approaches to generate futures perspectives, using the descriptions found in Unit I of the Sourcebook ("Approaches for Generating Futures Perspectives"). These approaches are shown on Transparency 6.

APPROACHES TO GENERATE FUTURES PERSPECTIVES

- ANTICIPATORY LEARNING
- PROJECTION AND FORECASTING
- PREVENTION AND ADAPTATION
- INVENTION AND CREATION

TM-6

Explain that the organization of Module 7 is based on these four approaches that will be taken up, in turn. The selection of appropriate techniques for presenting situations is emphasized in Unit VI, the last unit of Module 7.

Videotape: "Tomorrow Starts Today" (45 minutes)

It is recommended that the videotape, "Tomorrow Starts Today," be shown at this point to assist learners in perceiving the content of the module as relevant. In the videotape, several situations are described in which techniques for futures perspectives are important to Cooperative Extension's publics or to Extension's own organization. However, the videotape also can be used effectively by showing only the introduction at this point in the workshop, and then showing parts of it at other points during the workshop. Still another way to use the videotape is at the end of the workshop as part of Unit VI.

Examples of Situations for Technique Use (20 minutes)

After participants have viewed the videotape, suggest that they discuss, in pairs, their response to the videotape, and identify as many situations as they can think of in which generating futures perspectives may be important. Challenge them to think of their publics' futures and to identify decision situations that each may face. (You may want to eliminate this activity if you used the suggested activity, "Introduction of Participants.") After approximately 10 minutes, ask participants to share their ideas with the total group. You may want to record their ideas on newsprint to display during the rest of the workshop. After participants have been introduced to the techniques, they will be asked to make recommendations regarding selection of appropriate techniques for these types of situations. Remind participants that descriptions of techniques are accompanied by examples of situations in the Sourcebook.

Cooperative Extension's Opportunity and Role (15 minutes)

Introduce this topic by asking participants to consider Cooperative Extension's opportunity and role in using techniques for generating futures perspectives. Refer participants to the Sourcebook, Unit I materials on this topic, and ask them to do two things while discussing the material, in pairs:

1. Suggest additional Cooperative Extension opportunities and roles in the use of techniques for generating futures perspectives.

2. Select from the list those ideas most likely to persuade their colleagues to accept their activities in futures perspectives.

Allow 10 minutes for this discussion. Then display Transparency 7 to focus reporting and discussion regarding the rationale for Cooperative Extension's use of futures perspectives techniques.

TECHNIQUES FOR FUTURES PERSPECTIVES: COOPERATIVE EXTENSION'S OPPORTUNITIES AND ROLE

- EXTENSION ORGANIZATION AND EXTENSION'S PUBLICS
- LAND-GRANT INSTITUTION FUTURES RESEARCH METHODS
- PROCESS SKILL PROGRAMMING
- ORIENTATION: REACTIVE—PROACTIVE
- INFORMED CITIZENS
- BRIDGES: TECHNOLOGISTS—DECISIONMAKERS—GENERAL PUBLIC
- DEMOCRATIC DECISIONMAKING
- ALTERNATIVE VISIONS: DETERMINISTS—UTOPIANS
- EXTENSION PROCESS ROLES

TM-7

Ask: "What typical groups within Cooperative Extension's own organization can make use of futures perspectives techniques?" Transparency 8 can be shown to broaden awareness of applications.

WHO CAN MAKE USE OF TECHNIQUES FOR FUTURES PERSPECTIVES?

EXTENSION'S OWN ORGANIZATION:

- COUNTY STRATEGIC PLANNING TASK FORCES
- STATE EXTENSION FUTURE ISSUES TASK FORCE
- COUNTY PROGRAM PLANNING COMMITTEE
- SEA-GRANT PROGRAM PLANNING
- INSTITUTION DEPARTMENT/ AGENT PROGRAM COMMITTEE
- PROFESSIONAL ASSOCIATIONS

TM-8

Ask: "What typical Extension publics can make use of futures perspectives techniques?" Transparency 9 gives several examples.

WHO CAN MAKE USE OF TECHNIQUES FOR FUTURES PERSPECTIVES?

EXTENSION'S PUBLICS:

- 4-H VOLUNTEERS AND YOUTH
- INDIVIDUALS AND FAMILIES
- VOLUNTARY ASSOCIATIONS AND ORGANIZATIONS
- COMMODITY COUNCILS
- COOPERATIVES
- HUMAN SERVICE AGENCIES
- EDUCATIONAL INSTITUTIONS
- BUSINESS ORGANIZATIONS
- COUNCILS OF ORGANIZATIONS AND AGENCIES
- LOCAL GOVERNMENT UNITS
- PLANNING DEPARTMENTS

TM-9

Encourage participants to name other groups with which they work that could use these techniques.

Summarize the discussion on Cooperative Extension's opportunity and roles in the use of techniques for generating futures perspectives. Point out that this wide range of uses and users requires familiarity with an equally wide variety of techniques.

Self-Assessment Instrument Reflection (10 minutes)

Ask the participants to look at Handout 2: "Self-Assessment Instrument; Knowledge of Techniques for Futures Perspectives," which was mailed to them as part of their preworkshop packet. Explain that undertaking this self-assessment of their knowledge of futures perspectives techniques is one way to become sensitized to what they are about to learn, and to appreciate how much they have learned by retaking the self-assessment at the end of the workshop. If the participants have done their preworkshop homework, they will be able to tell you which parts of the workshop to emphasize. If participants have not used this self-assessment instrument, encourage them to do so after this session.

Encourage the learners to summarize the main ideas that have been emphasized in Unit I and Handout 4: "A Glossary of Futures Study Terminology."

Point out the sequence of the remaining units:

Unit II. Anticipatory Learning

Unit III. Projection and Forecasting

Unit IV. Prevention and Adaptation

Unit V. Invention and Creation

Unit VI. Selecting Techniques for Futures Perspectives

Unit II. Anticipatory Learning

Suggested Format

The activities suggested for Unit II and the time to be devoted to each are as follows:

Introduction to Anticipatory Learning. (10 minutes)

Personal Time Perspectives Differences. (10 minutes)

Self-Directed Learning: Overview of Futures Literature (20 minutes)

Visual Reflection: Futures-Oriented Media. (40 minutes)

Reading and Dialogue: Fictional Futures Literature. (20 minutes)

Futures-Oriented Games and Simulations. (20 minutes)

Total time for Unit II—2 hours

Materials Needed

Sourcebook, Unit II

Handouts 1, 3, 5, and 6

TIP Sheets 1, 2, and 3

Transparencies 10 through 21

Introduction to Anticipatory Learning (10 minutes)

Provide a brief introduction of the ideas in Unit II of the Sourcebook ("Introduction to Anticipatory Learning"). Emphasize (1) the purposes of anticipatory learning; (2) the capacities required for anticipatory learning; and (3) the limitations of having to "learn by shock." Transparencies 10 and 11 may be used for this mini-lecture.

PURPOSES OF ANTICIPATORY LEARNING

1. FREE PERSONS FROM SOCIALLY IMPOSED EXPECTATIONS;
2. INTRODUCE ALTERNATIVE FUTURES PERSPECTIVES THROUGH LITERATURE, MEDIA, AND GAMES; AND
3. PROVIDE OPPORTUNITIES TO ASSESS ETHICAL AND MORAL DECISIONS THAT HAVE AN IMPACT ON THE FUTURE

TM-10

CAPABILITIES REQUIRED FOR ANTICIPATORY LEARNING

- OVERCOME RESISTANCE TO FUTURES THINKING
- REFLECT ON SOCIAL ASSUMPTIONS
- IMAGE POSITIVE FUTURE CONDITIONS
- EVALUATE CONSEQUENCES OF DECISIONS
- CONSIDER SIDE EFFECTS AND UNINTENDED EFFECTS
- RECOGNIZE RELATIONSHIP OF WHOLES TO PARTS
- DETECT INTERRELATIONSHIPS OF EVENTS
- MAKE PLANS AND STRATEGIES

TM-11

Personal Time Perspectives Differences (10 minutes)

Extension educators who are conducting anticipatory learning experiences should note that there are individual and sometimes cultural differences in time perspectives of learners. In addition, there are many reasons why persons may resist thinking about the future. Refer to Sourcebook, Unit II, material on "Differences in Personal Time Perspective," and Handout 5: "Personal Orientations to Futures Thinking." Ask each participant to develop as many answers to the questions as possible in three minutes.

After participants have done this, encourage them to share their answers, in pairs, for three minutes. Then list the responses from the group on newsprint or on a chalkboard for all to see. Use participants' responses to the questions on Handout 5 to draw attention to the variety of approaches people take toward thinking about the future.

Transparency 12, "Ways We Avoid Thinking About the Future" (being too busy and preoccupied with present problems, procrastinating, being buried in routines, escaping to fatalism, and trusting in authority and technology) can be used to stimulate discussion built on these observations.

WAYS WE AVOID THINKING ABOUT THE FUTURE

- WE DON'T HAVE TIME TO THINK ABOUT THE FUTURE NOW.
- WE WILL THINK ABOUT THE FUTURE TOMORROW.
- DON'T INTERRUPT OUR ROUTINE.
- WHATEVER WILL BE, WILL BE.
- TECHNOLOGY WILL SAVE US.

TM-12

Transparency 13 suggests that failure to consider the long-term future can result in decisions that are expedient, but sometimes costly. Among other results is failure to see impending large changes, because one is preoccupied with merely improving, in small increments, present solutions. In addition, failure to anticipate the future can result in having to learn the hard way, i.e., experiencing the consequences of one's choices "by shock." These problems, all of which result from avoiding thinking about the future, may endanger future generations.

RESULTS OF FUTURES THINKING AVOIDANCE

- EXPEDIENCY
- "MUDDLING THROUGH"
- "LEARNING BY SHOCK"
- ENDANGERMENT OF FUTURE GENERATIONS

TM-13

Transparency 14: "Incentives for Study" can be used to stimulate thinking about how educators can encourage people to think about the future.

INCENTIVES FOR FUTURES STUDY

- WORTHWHILE GOALS
- NEGATIVE OUTCOMES
- MOTIVATION
- HUMAN DESTRUCTIVENESS
- OPTIONS AND POSSIBILITIES
- FUTURE GENERATIONS
- EMERGING OPPORTUNITY
- A PLANETARY ETHIC
- CURIOSITY AND IMAGINATION
- A COMMON GOOD

TM-14

Some ideas that can be used to supplement Transparency 14 follow.

Some people may be stimulated to think about the future because they see worthwhile goals as a benefit. Others may anticipate new options, possibilities, and emerging opportunities that otherwise would not have been recognized. A positive vision of the future can increase motivation and attract energy and resources. For some, the future offers a challenge to their curiosity and imagination. Certainly, most persons want futures studies to help us avoid negative outcomes or human destructiveness. For still others, the major incentive for futures studies is the desire to contribute to a common good. Many persons are concerned about the survival of future generations. These persons may see the study of the future as one means by which a planetary ethic can be encouraged. You may want to encourage the participants to identify other incentives for futures study.

Use the discussion on avoidance, results of avoidance, and incentives for futures study as a basis for introducing the concepts in "Personal Time Perspectives Differences" (Sourcebook, Unit II). This material can be summarized by you, or it can be discussed by the participants, if they have read it prior to the workshop.

Point out that participants who want to read further on time perspectives can begin with the article by Sork (1980) in Handout 6: "Developing a Future Time Perspective." In that article, Sork quotes Green on developmental stages that individuals go through in relation to time perspectives. Transparency 15 can be shown to summarize this material.

DEVELOPMENTAL STAGE TIME PERSPECTIVES

Year(s)	
1	Permanence of Objects and Persons
1-3	Clock Time
3-5	Restriction Time
6-11	Causal Sequences
12-15	Personal Time
15-25	Mutual Time
18-25	Alternatives In Time
25-40	The Uses of Time
40-50	Reconsidered Time
50-60	The Foreshortened Future
65 on	The Rich Past

TM-15

Refer to Handout 3: "In Search of Futurists: Futures Quotient (FQ) Self-Assessment Instrument." This exercise was completed by the participants as a preworkshop assignment. Explain that the FQ will assist participants in considering the extent to which they have a futures orientation. Encourage them to discuss, in pairs, their responses. Ask them to reflect upon their own scores in relation to the ideas presented in time perspectives. After a brief discussion period, display the qualities embodied in the FQ shown in Transparency 16. Ask participants to reflect on the qualities they rated themselves as having most.

QUALITIES OF FUTURIST-ORIENTED PEOPLE

- BALANCED PERSPECTIVE
- EMPIRICAL PERSPECTIVE
- BELIEVES IN CREATING THE FUTURE
- INNOVATIVE
- STIMULATED BY THE FUTURE
- GLOBAL PERSPECTIVE
- CHALLENGED BY UNCERTAINTIES
- IMAGINATIVE
- MODEST FORECASTER
- SEEKS DIVERSE INFORMATION
- CAREFUL RISK TAKER
- HOLISTIC PERSPECTIVE
- PROCESS-ORIENTED
- CREATIVE
- SELF-DEFINED FUTURIST

TM-16

Display Transparency 17. Point out that each of these techniques can contribute to anticipatory learning, and that each will be presented, in turn.

TECHNIQUES FOR ANTICIPATORY LEARNING

- SELF-DIRECTED LEARNING: FUTURES LITERATURE
- VISUAL REFLECTION: FUTURES-ORIENTED MEDIA
- READING AND DIALOGUE: FICTIONAL FUTURES
- FUTURES GAMES AND SIMULATIONS

TM-17

Self-Directed Learning: Overview of Futures Literature (20 minutes)

The major purpose of this discussion of self-directed learning is to stimulate the participant's interest in self-directed learning projects taken from the vast array of futures literature.

Refer the participants to Handout 1: "Touring Futures II: A Literature Guide to Futures Study for Cooperative Extension" in the preworkshop materials. Without embarrassing participants who have not read the assignment, ask the group to scan the article and, in pairs, to consider the questions displayed in Transparency 18.

QUESTIONS ON "TOURING FUTURES II: A LITERATURE GUIDE TO FUTURES STUDIES FOR COOPERATIVE EXTENSION"

- WHICH AUTHORS HAVE YOU MET BEFORE?
- WHAT TIPS FOR TOURISTS ARE SURPRISING?
  - No Qualifications to be a "Futurist"
  - There Is No Futures "Field"
  - There Are No Magic Techniques
  - Distinguish Between Forecasts and Proposals
  - Avoid Pollyanna and Cassandra
  - Futures Thinking Is Subversive, Conserving, and Amusing
  - Most Forecasts Are Likely to Be Wrong
- WHICH TOURS INTEREST YOU?
  - Overviews and Introductions
  - Society and Technology
  - Natural Resources
  - Human Resources

TM-18

Lead a discussion, encouraging participants to commit themselves to future self-directed reading in specific areas of the futures literature. Ask the participants to suggest ways in which the Cooperative Extension System could encourage its publics to pursue self-directed learning projects described in futures literature.

Visual Reflection: Futures-Oriented Media (40 minutes)

This part of the instruction for Unit II is based on "Visual Reflection: Futures-Oriented Media" in the Sourcebook, Unit II. The purpose is to focus attention on the positive use of futures-oriented visual media in promoting anticipatory learning. Emphasize the purposes and procedures outlined in the Sourcebook.

Describe some of the films or videotapes available on alternative perspectives on the future. (See film sources and examples of films and videotapes listed in TIP Sheet 1). It is suggested that one of these films or videotapes be shown to the group to demonstrate the way a film can be used to stimulate reflection and discussion. Transparency 19 can be used to spark discussion of a videotape or film.

PROCEDURES FOR VISUAL REFLECTION: FUTURES-ORIENTED MEDIA

1. Identify Future Concern or Dilemma
2. Select Visual Media
3. Assign Questions Prior to Viewing:
    - Feelings About the Future?
    - Valued Visions of the Future?
    - Accurate Projections?
    - Consequences to Be Avoided?
    - Ethical or Moral Issues?
    - New Images Worth Considering?
4. View the Media
5. Share Observations, Judgments, and Concerns
6. Identify Choices

TM-19

Call attention to the situations related to visual media described in Unit II of the Sourcebook ("Visual Media Example Situations"). Ask participants whether or not they would consider using visual media in these situations. Encourage them to add other possible situations to the list.

Reading and Dialogue: Fictional Futures Literature (20 minutes)

One reason for including fictional futures literature as a technique for encouraging anticipatory learning is that this literature is widely read as a recreation by a sizable segment of the population. Extension educators who wish to encourage anticipatory learning may want to begin with this large group of readings, then add group dialogue as a prelude to planning activities. Science fiction clubs could be organized. English teachers could be used as resource persons for these groups.

Introduce the reading and dialogue technique by referring to the material on "Reading and Dialogue: Fictional Futures Literature," in Unit II of the Sourcebook. Encourage participants to share with each other their experiences in reading futures fiction. Examples of futures fiction should be on display.

Suggest the participants use the "Reference Guides" listed in TIP Sheet 2, and note possible applications. Several situations in which the use of fictional futures literature could be helpful are also described in TIP Sheet 2. Learners should, through discussion in small groups, identify additional example situations for fictional futures literature use. You may choose to use Transparency 20 during consideration of possible situations in which this technique would be appropriate.

PROCEDURES FOR READING AND DIALOGUE: FICTIONAL FUTURES LITERATURE

1. OBTAIN COMMITMENT
2. IDENTIFY DILEMMAS
3. SELECT A COMMON FICTIONAL FUTURES WORK
4. TAKE NOTES ON ISSUES, IMAGES, VALUES, AND CHOICES
5. DISCUSS FUTURES PERSPECTIVES REVEALED IN NOVELS
6. COMPARE PERSPECTIVES
7. IDENTIFY CHOICES

TM-20

Futures-Oriented Games and Simulations (20 minutes)

Give a summary mini-lecture on the history of games and simulations and their functions, purposes, and advantages. Use the Sourcebook, Unit II, content on "Futures-Oriented Games and Simulations." [*Note:* If one of the participants has prepared this in an advance assignment, he or she can give the mini-lecture.] Draw attention to the purposes of games and simulations in viewing the future, sources of information on games and simulations, examples of futures-oriented games and simulations, and microcomputer futures-oriented games (TIP Sheet 3).

An alternative activity is to introduce one of the games and have participants play it for a brief period as a demonstration. If this is done, you will want to use the demonstration to start discussion and reflection on the value of futures-oriented games in anticipatory learning. Transparency 21 also can be used to help explain this activity.

PROCEDURES FOR FUTURES-ORIENTED GAMES AND SIMULATIONS

1. SET EDUCATIONAL GOALS
2. SELECT GAMES THAT RELATE TO THE GOALS
3. EXPLAIN THE EDUCATIONAL OBJECTIVES
4. FACILITATE THE GAME OR SIMULATION
5. ENCOURAGE DIALOGUE
6. IDENTIFY CHOICES

TM-21

Call attention to the sources of information and example situations for futures-oriented games and simulations described in TIP Sheet 3. Encourage participants to comment on these situations, or to identify others in which futures-oriented games or simulations could be useful aids in anticipatory learning among Extension's publics.

Summary: Anticipatory Learning

Help the participants summarize the four techniques for encouraging anticipatory learning: (1) "Self-Directed Learning: Overview of Futures Literature"; (2) "Visual Reflection: Futures-Oriented Media"; (3) "Reading and Dialogue: Fictional Futures Literature"; and (4) "Futures-Oriented Games and Simulations." Transparency 17 can be used to focus attention during the summary.

TECHNIQUES FOR ANTICIPATORY LEARNING

- SELF-DIRECTED LEARNING: FUTURES LITERATURE
- VISUAL REFLECTION: FUTURES-ORIENTED MEDIA
- READING AND DIALOGUE: FICTIONAL FUTURES
- FUTURES GAMES AND SIMULATION

TM-17

Call attention to the list of microcomputer software for future-oriented games (TIP Sheet 3).

Remind the participants of the sequence of the remaining units:

Unit III. "Projection and Forecasting"
Unit IV. "Prevention and Adaptation"
Unit V. "Invention and Creation"
Unit VI. "Selecting Techniques"

Unit III. Projection and Forecasting

Suggested Format

The activities suggested for Unit III and the time to be devoted to each are as follows:

- Introduction to Projection and Forecasting (10 minutes)
- Historical Precedents (5 minutes)
- Delphi Analysis (30 minutes)
- Trend Extrapolation (30 minutes)
- Cross-Impact Analysis (30 minutes)
- Computer Uses and Limitations (15 minutes)

Materials Needed

Sourcebook, Unit III

Transparencies 22 through 30

Handouts 7 and 8

TIP Sheets 4, 5, and 6

Introduction to Projection and Forecasting (10 minutes)

Projection and forecasting techniques are introduced in Unit III. Each of the topics could be expanded with additional material and hands-on exercises. References are included as resources for further self-directed learning.

You are encouraged to build upon the examples that are in Unit III of the Sourcebook, and to use examples from the participants to increase awareness of the relevance of the techniques to various situations and publics.

Introduce Unit III with a mini-lecture or discussion in which you introduce techniques for projection and forecasting futures perspectives. The materials in Unit III of the Sourcebook (''Overview of Projection and Forecasting Techniques'') can be used as a basis for a mini-lecture, or assigned as preworkshop reading. In either case, it is recommended that you ask the participants to form small groups as they express reactions to the material and formulate questions that they would like discussed.

The Sourcebook presents the limitations of forecasting techniques, typical steps in implementing forecasting approaches, sources of relevant forecasting data, and an overview of futures research centers. Transparencies 22 and 23 focus on this content.

LIMITATIONS OF FORECASTING TECHNIQUES

- NO REGULARITIES OF EVENTS
- SIGNIFICANT VARIABLES OMITTED
- LONG-TERM PROJECTIONS
- TRUST COMPUTERS
- QUALITY GUARANTEED BY COMPLEXITY

TM-22

ACTIVITY SEQUENCE FOR THE USE OF FORECASTING

1. ESTABLISH PRIORITIES
2. IDENTIFY RELEVANT FORCES
3. IDENTIFY DATA FOR INDICATORS
4. PROJECT FROM DATA FOR EACH RELEVANT FORCE
5. DRAW IMPLICATIONS FROM THE FORECASTS
6. DEVISE STRATEGIES FOR ACTION

TM-23

Access to Resources

Ask participants how familiar they are with the periodicals and books listed in Unit III of the Sourcebook that contain data profiles for numerous indicators. The participants can add others with which they are familiar. Local professionals, who can help in locating data profiles of interest to participants, can provide consulting for this unit.

Overview of Futures Research Centers

Information on futures research centers is included in Unit III because these centers often provide special studies and reports that are available to the public. These futures research centers also may provide consultation for specific situations. Identify any centers that are located within the participants' region.

Techniques for Projection and Forecasting

Display Transparency 24 and explain that the session will focus briefly on historical precedent, Delphi, trend extrapolation, cross-impact analysis, and computer uses and limitations.

MAJOR TECHNIQUES FOR PROJECTION AND FORECASTING

- HISTORICAL PRECEDENT
- DELPHI ANALYSIS
- TREND EXTRAPOLATIONS
- CROSS-IMPACT ANALYSIS
- COMPUTER USES AND LIMITATIONS

TM-24

Historical Precedent (5 minutes)

Remind participants that historical precedent is the oldest of all the forecasting methods, and that our first step always should be to ask, "Can we find any historical precedents that will orient our forecasts?" Qualitative descriptions of historical events and case studies that are similar to the situation we are attempting to forecast usually are helpful, especially in identifying key questions and significant variables. Ask participants to think of events for which there was historical precedent—particularly instances in which the lessons of the past were overlooked.

Delphi Technique (30 minutes)

Define the Delphi technique for the participants and describe its characteristics, using content from the Sourcebook, Unit III, and TIP Sheet 4. Assigning these materials to a participant in advance, with that participant making a presentation on the content, is an alternative way of introducing this technique.

Transparencies 25 and 26 focus on discussion and reactions to the mini-lecture.

PURPOSES OF DELPHI ANALYSIS

- FORECAST LONG-RANGE TRENDS
- FORECAST TECHNOLOGY DEVELOPMENT
- OBTAIN PROBABILITY JUDGMENTS ON EVENTS
- INTERPRET TREND EXTRAPOLATION DATA
- GENERATE POLICY ALTERNATIVES
- ASSESS POSSIBLE CONSEQUENCES

TM-25

PROCEDURES FOR DELPHI ANALYSIS

1. FORM A MONITORING TEAM
2. SELECT ONE OR MORE PANELS
3. DEVELOP FIRST-ROUND QUESTIONNAIRE
4. PRETEST THE QUESTIONNAIRE
5. ADMINISTER FIRST-ROUND QUESTIONNAIRE
6. ANALYZE FIRST-ROUND RESPONSES
7. PREPARE SECOND-ROUND QUESTIONNAIRE
8. ADMINISTER SECOND-ROUND QUESTIONNAIRE
9. ANALYZE SECOND-ROUND RESPONSES
10. PREPARE ANALYSIS TEAM REPORT

TM-26

For an alternative activity, suggest that small groups (two to four persons) work on the example situations found in Unit III of the Sourcebook. Each group could report the steps in the use of the Delphi for its situation—purpose served, kinds of experts selected, major questions, and so forth.

Five examples of situations in which the Delphi technique can be used are described in Unit III of the Sourcebook ("Delphi Example Situations"). These situations could be assigned to small groups for participants to discuss how they would go about conducting a Delphi. Alternatively, ask participants to nominate their own situations.

Trend Extrapolation (30 minutes)

Introduce the use of trend extrapolation as a technique for making projections about the future. The material on "Trend Extrapolation" (Sourcebook, Unit III, and TIP Sheet 5) can be the basis of a mini-lecture by either you or a participant who has prepared in advance for this presentation. Transparencies 27 and 28 can be used to focus participants' attention.

ADVANTAGES OF TREND EXTRAPOLATION

- EASY TO EXECUTE
- COST-EFFECTIVE WHEN DATA ARE AVAILABLE
- INSIGHTS ON PATTERNS OF EVENTS
- CREDIBLE PROJECTIONS FOR REGULAR EVENTS

TM-27

STEPS INVOLVED IN TREND EXTRAPOLATION

1. ESTABLISH THE PROBLEM OF CONCERN
2. IDENTIFY SPECIFIC NUMERICALLY INDEXED INDICATORS
3. ACQUIRE DATA ON EACH INDICATOR FOR TIME PERIODS
4. PLOT THE DATA POINTS FOR EACH TIME PERIOD ON A GRAPH
5. PROJECT THE LINE ON THE GRAPH INTO FUTURE TIME, TAKING INTO CONSIDERATION THE OVERALL PATTERN OF THE LINE
6. IDENTIFY POSSIBLE IMPLICATIONS FROM THE TREND.
7. CREATE AN ACTION STRATEGY BASED ON TREND IMPLICATIONS

TM-28

An alternative activity would be to encourage participants, in small groups, to analyze example situations found in Unit III of the Sourcebook. This should be followed by a discussion of the advantages of using trend extrapolations, and the steps involved in undertaking them.

Encourage participants to engage in a simple trend extrapolation exercise, using census data from their own counties or other locally available data sets on a topic of interest to the participants. Typical trend extrapolation indicators are: changes in population according to census data, changes in personal income levels, employment rates, numbers of single-parent households, mortality rates and suicides, bankruptcies and foreclosures, housing starts and sales, and occupancy of hotels, motels, and resorts. The important thing to keep in mind about trend extrapolation is that the trend is meaningless unless participants can generate, from the trend, implications for decisions and action.

Call participants' attention to "Some Key Considerations in the Use of Trend Extrapolation" (Sourcebook, Unit III). When projecting a trend, we should recognize the possibility of seasonal patterns, cyclical factors, and irregular shocks.

In summarizing the instruction, mention these points on the use of trend extrapolation:

- Use only if time series data are accessible;
- Use simple approaches first, then advance to more complex approaches; and
- Use trend extrapolation in combination with other techniques.

Unit III of the Sourcebook contains five example situations in which trend extrapolations could be helpful. These situations, and others identified by participants, can be used to illustrate mini-lectures or focus participants' work, in small groups, on how to go about actually doing a trend extrapolation.

Cross-Impact Analysis (30 minutes)

Provide a brief description of cross-impact analysis, and its advantages and disadvantages, using material from Unit III of the Sourcebook. Cross-impact approaches answer the following basic question: "Supposing this event were to occur, what is the probability of other identified events occurring?" Responses to this question for each event are recorded in a matrix. Transparencies 29 and 30 can be used as part of this introduction.

ADVANTAGES OF CROSS-IMPACT ANALYSIS

- EXPRESSES PROBABILITY OF IMPACTS OF ONE EVENT ON ANOTHER
- UNCOVERS NEW INFORMATION
- USES DELPHI-GENERATED EXPERT OPINION
- ASSISTS THINKING ABOUT EFFECTS OF POTENTIAL POLICIES
- REVEALS CUMULATIVE EFFECTS ON WHOLE SYSTEMS
- USEFUL FOR MARKET AND PRODUCT OPPORTUNITIES, FOREIGN POLICY ISSUES, INSTITUTIONAL GOALS, NATURAL RESOURCES, DEFENSE, ECOLOGY, EDUCATION, AND OTHER AREAS

TM-29

PROCEDURES FOR CROSS-IMPACT ANALYSIS

1. DEFINE EVENTS INCLUDED IN THE ANALYSIS
2. ESTIMATE INITIAL PROBABILITY FOR EACH EVENT
3. ESTIMATE THE PROBABLE INFLUENCE OF EACH EVENT ON OTHER EVENTS BEING CONSIDERED
4. SPECIFY THE ESTIMATES FOR EACH SPACE IN THE MATRIX
5. SUMMARIZE THE OVERALL ESTIMATES FOR EACH EVENT
6. INTERPRET THE FINDINGS

TM-30

Unit III of the Sourcebook contains several hypothetical situations in which cross-impact analysis could be useful. Encourage participants to identify other situations. These can be used as starting points for small groups to think through the application of procedures for cross-impact analysis. An overview of cross-impact analysis appears in TIP Sheet 6 (Instructional Aids).

Computer Uses and Limitations (15 minutes)

Ask participants to describe their familiarity with computers and their use in accessing databases. After encouraging informal comments, call attention to the reference guides to computer programs and computer on-line databases listed in Unit III of the Sourcebook (''Reference Guide to Computer Programs''). Ask participants, in small groups, to share their experiences with the use of computers for projection and forecasting.

Handout 7: ''Could a Computer Replace Your County Agent?'' can be used as a discussion starter, in small groups, as an alternative activity. This handout helps Extension field staff members to perceive computers as tools or assistants, rather than as potential replacements.

A discussion of global modeling is included because Cooperative Extension professionals and their publics should know both the promise and the limitations of efforts to use computers for projection and forecasting on a global scale. This effort will undoubtedly become more sophisticated in the future, and may help our publics to think globally while deciding locally. We should be optimistic and, at the same time, skeptical. The material on ''Global Modeling,'' in Unit III of the Sourcebook, summarizes the views of some of the world's experts on the use of computers for this purpose. Encourage participants to read it and to discuss their reactions in groups of three or four persons. You may want to use Handout 8: ''A Word From the Global Computer Modelers'' as additional learning resources to illustrate the value concerns expressed at an international conference of global computer modelers.

Summary: Projection and Forecasting

In summarizing Unit III, use Transparency 24 as a focus on historical precedents, Delphi analysis, trend extrapolation, cross-impact analysis, and computer uses and limitations. Draw discussion from the participants.

TECHNIQUES FOR PROJECTION AND FORECASTING

- HISTORICAL PRECEDENT
- DELPHI ANALYSIS
- TREND EXTRAPOLATIONS
- CROSS-IMPACT ANALYSIS
- COMPUTER USES AND LIMITATIONS

TM-24

Point out the sequence of the remaining units:

Unit IV. ''Prevention and Adaptation''

Unit V. ''Invention and Creation''

Unit VI. ''Selecting Techniques''

Unit IV. Prevention and Adaptation

Suggested Format

The activities suggested for Unit IV and the time to be devoted to each are as follows:

History of Impact or Risk Assessment (15 minutes)

Categories of Impact Assessment:

- Economic Impact (15 minutes)
- Technology Impact (15 minutes)
- Environmental Impact (15 minutes)
- Social Impact (15 minutes)

Purposes and procedures for Impact Assessments (15 minutes)

Decision Dilemmas and the Role of Participation (15 minutes)

Roles for Cooperative Extension Professionals (15 minutes)

Total time for Unit IV—2 hours

Materials Needed

Sourcebook, Unit IV

Transparencies 31 through 43

Handout 9: "Worksheet on Types of Impacts"

Examples of environmental impact assessment reports (not included in Module materials; to be secured locally).

History of Impact or Risk Assessment (15 minutes)

Begin Unit IV by inviting participants, in groups of three, to reflect on technologies, projects, and policies that have had unforeseen, unintended, and unwanted consequences. After five minutes, share these observations with the total group and list them on newsprint or on a chalkboard. Use these examples as a basis for introducing techniques for generating prevention and adaptation futures perspectives.

Categories of Impact Assessment

Encourage participants to read the material on the "History of Impact or Risk Assessment" (Sourcebook, Unit IV), or summarize the contents in the form of a mini-lecture.

Display Transparency 31 while giving a mini-lecture on the history of impact or risk assessment.

CATEGORIES OF IMPACT ASSESSMENT

- ECONOMIC IMPACT ASSESSMENT
- TECHNOLOGY IMPACT ASSESSMENT
- ENVIRONMENTAL IMPACT ASSESSMENT
- SOCIAL IMPACT ASSESSMENT

TM-31

Discuss the concept of "risk." The key points are highlighted in Transparency 32.

DEFINITION OF RISK

RISK IS THE POSSIBILITY OF SUFFERING HARM OR LOSS, OR THE FACTOR, ELEMENT, OR COURSE THAT INVOLVES UNCERTAIN DANGER OR HAZARD.

TM-32

Define the term "impact." Display Transparency 33.

DEFINITION OF IMPACT

IMPACT: THE EFFECT OF ONE THING ON ANOTHER

PRIMARY IMPACTS—DIRECT RESULTS OF ACTION OR EVENT

SECONDARY IMPACTS—RESULTS OF PRIMARY IMPACTS

INDIRECT OR RELATED IMPACTS—RESULTS THAT ARE UNSEEN OR NOT IMMEDIATELY APPARENT

TM-33

To illustrate the importance of thinking in terms of primary, secondary, and indirect or related impacts, ask the participants, in pairs, to consider any of several technologies with which all are familiar (radio, television, telephone, automobiles, airplanes, computers). Ask each small group to select one of these technologies and to identify a primary, secondary, or indirect impact that technology has had on them personally, on their local community, and on global society. Ask them to consider both positive and negative impacts. Handout 9: "Worksheet on Types of Impacts" can be used for this activity.

Ask participants to share brief reports of their analyses of impacts of common technologies. Encourage participants, on their own, to think about potential primary, secondary, and indirect impacts of other technologies or events that are now emerging, such as biotechnology research applications.

Economic Impact Assessment (15 minutes)

Refer the participants to the content on "Economic Impact Assessment" (Sourcebook, Unit IV). Transparency 34 can be displayed.

EXAMPLES OF ECONOMIC IMPACT CATEGORIES

- EMPLOYMENT OPPORTUNITIES
- TAX AND PROPERTY VALUE CHANGES
- TAX REVENUE—COST OF LOCAL GOVERNMENT
- DISPLACEMENT OF BUSINESS-FARMS
- INDUSTRY-BUSINESS ACTIVITIES
- DISRUPTION OF COMMUNITY GROWTH
- COST OF LIVING—STANDARD OF LIVING
- LONG-TERM PRODUCTIVITY
- ENERGY REQUIREMENTS
- ENERGY CONSERVATION

TM-34

Three example situations in which economic impact assessments would be helpful are described in Unit IV of the Sourcebook. You may want to assign these examples, or others identified by participants, to small groups for discussion and analysis. The small groups can be asked to discuss which categories shown in Transparency 34 are most likely to be the focus for each example situation.

Technology Impact Assessment (15 minutes)

Background for "Technology Impact Assessment" is in the Sourcebook, Unit IV. Distinguish between technology forecasting and technology impact assessment. Technology forecasting projects the extent of diffusion and adoption by specific segments of society, which obviously is important to those who sell technology. Technology impact assessment, on the other hand, identifies present and foreseeable effects and attempts to prevent unintended negative consequences. Transparency 35, "Examples of Technology Impact Assessment Categories" can be used by the leader to display the broad types of technologies.

EXAMPLES OF TECHNOLOGY IMPACT CATEGORIES

- COMPUTERS
- BIOTECHNOLOGY
- MILITARY
- FOOD PROCESSING
- WASTE TREATMENT
- SHORELINE FISHING
- AGRICULTURAL PRODUCTIVITY
- MINING AND OCEAN MINERALS
- CONSTRUCTION AND HOUSING
- WATER SUPPLY
- MEDICAL
- NUCLEAR ENERGY
- TRANSPORTATION
- ENERGY
- FOREST RESOURCES

TM-35

Ask the participants, in small groups, to discuss which technologies they think are likely to have extensive impact on the publics with whom they work. After the small groups have made their lists, they could be asked to report briefly. The example situation on electronic technology in Unit IV of the Sourcebook also could be used as a basis for discussion.

Environmental Impact Assessment (15 minutes)

Introduce "Environmental Impact Assessment" by referring to Unit IV of the Sourcebook. Ask participants to name environmental impact assessments with which they are familiar. List their responses on newsprint or on a chalkboard. Impact assessment reports may be obtained from the Natural Resource Department of your land-grant institution, from local planning offices, and from the state or federal government.

EXAMPLES OF ENVIRONMENTAL IMPACT ASSESSMENT CATEGORIES

- AIR QUALITY
- NOISE POLLUTION
- WATER RESOURCES
- WILDLIFE
- VISUAL RESOURCES
- WILDERNESS
- AGRICULTURE
- NATIVE AMERICAN CONCERNS
- TRANSPORTATION
- VISIBILITY
- SOILS
- VEGETATION
- PALEONTOLOGY
- RECREATION
- LAND USE
- FORESTS
- ARCHAEOLOGY
- SOCIOECONOMIC CONCERNS

TM-36

After displaying Transparency 36, suggest that participants, in small groups, review or scan the environmental assessment reports to determine which of the effect categories were addressed in the documents. Point out that the bias in such reports may not always be reflected in their estimates or projections. Rather, it may be in the failure to include specific categories that could be damaging to specific interest groups.

Example environmental situations, found in Unit IV of the Sourcebook, also provide material upon which to base small group discussions. Examples on dioxin, landfills, strip-mining, and contaminated wells can be assigned to different small groups. In this activity, ask the groups to identify the impact categories that each example would require.

Social Impact Assessment (15 minutes)

Introduce social impact assessment by stating that these assessment categories were added to environmental impact assessments after it became widely recognized that social effects also were costly to ignore. Transparency 37 can be used to illustrate this mini-lecture.

EXAMPLES OF SOCIAL IMPACT ASSESSMENT CATEGORIES

- HEALTH AND SAFETY
- VARIETY AND DIVERSITY OF CHOICE
- EQUALITY OF OPPORTUNITY AND BENEFITS
- POPULATION MOBILITY, DENSITY, DISPLACEMENT
- HUMAN SERVICE AVAILABILITY
- AESTHETIC VALUE
- COMMUNITY COHESION
- LEISURE OPPORTUNITY
- HISTORICAL CONTINUITY
- PSYCHOLOGICAL SECURITY
- NEIGHBORHOOD STABILITY
- EDUCATIONAL OPPORTUNITY
- PUBLIC SERVICES
- RACIAL CONCENTRATION/ DIVERSITY
- CULTURAL IDENTITY

TM-37

Unit IV of the Sourcebook contains four example situations that are appropriate for social impact assessment, along with environmental impact assessment data. Small groups can be assigned one of these example situations to discuss. Ask groups to identify the social impact categories that each situation would require. Transparency 37 can be displayed for reference during this activity.

Point out to the group that, in many cases, it is not enough to conduct a single impact assessment. Comparison studies often are required, in which the impacts of alternative scenarios or proposals are examined. In some cases, different possible levels of development for the same location may require comparison. For example, a proposed coalburning electrical generating plant would affect the environment differently according to the size of the operation. In other cases, impacts of the same intervention implemented in different locations may be compared. For example, a solid-waste dump in one location may endanger the water supply more than in another location, because of soil composition differences. In still other cases, comparisons of potential impacts from different types of construction, treatment, or technology for the same location may be required. Transparency 38 can be shown to help make this point.

COMPARISON STUDIES FOR IMPACT ASSESSMENTS

- DIFFERENT LEVELS OF DEVELOPMENT FOR THE SAME LOCATION
- SAME LEVEL OF DEVELOPMENT FOR DIFFERENT LOCATIONS
- DIFFERENT TECHNOLOGIES OR TREATMENTS FOR THE SAME LOCATION

TM-38

Purposes and Procedures for Impact Assessment (15 minutes)

Purposes

Point out that impact analysis means providing:

1. An information base for understanding the complex effects of proposals;

2. An early warning system to prevent adverse effects;

3. A tool for people to use in protecting the interests of the public and those of future generations;

4. A means of identifying alternative approaches, technologies, and adaptations that are less harmful; and

5. A basis for planning that involves affected constituencies.

These points are summarized in Transparency 39.

PURPOSES OF IMPACT ASSESSMENTS

- UNDERSTAND COMPLEX EFFECTS OF IMPACTS
- PREVENT ADVERSE EFFECTS
- PROTECT THE PUBLIC'S INTEREST
- IDENTIFY ALTERNATIVE APPROACHES
- INVOLVE AFFECTED CONSTITUENCIES

TM-39

Procedures

Refer to "Procedures for Impact Assessments" (Unit IV, Sourcebook) for the general techniques in conducting impact assessments. Transparency 40 can be used to summarize the steps described in the Sourcebook.

PROCEDURES FOR IMPACT ASSESSMENTS

1. DEFINE THE ASSESSMENT TASK
2. DESCRIBE RELEVANT TECHNOLOGIES
3. DEVELOP STATE-SOCIETY ASSUMPTIONS
4. IDENTIFY IMPACTED AREAS
5. MAKE PRELIMINARY IMPACT ANALYSIS
6. IDENTIFY POSSIBLE ACTION OPTIONS
7. COMPLETE IMPACT ANALYSIS FOR EACH OPTION

TM-40

Decision Dilemmas and the Role of Participation (15 minutes)

Refer the participants to the content on "Decision Dilemmas of Impact Assessments" (Sourcebook, Unit IV). The typical tradeoffs or decision dilemmas associated with most impact assessments are shown in Transparency 41. Display this transparency and use it as a reference for the next activity. While Transparency 41 is being displayed, suggest that each small group select one of the cases that they have been examining during this unit and identify the decision dilemmas for that case.

DECISION DILEMMAS OF IMPACT ASSESSMENTS

- SHORT-TERM BENEFIT vs. LONG-TERM COSTS
- BENEFITS vs. TOLERABLE RISKS AND COSTS
- ECONOMIC GROWTH vs. ENVIRONMENTAL PROTECTION
- INDIVIDUAL-CONTROLLED TECHNOLOGY vs. CORPORATE-CONTROLLED TECHNOLOGY
- BENEFITS TO SOME vs. BURDENS TO OTHERS
- BENEFITS TO PRESENT GENERATIONS vs. BENEFITS TO FUTURE GENERATIONS

TM-41

State that impact or risk assessments are attempts to exert democratic control over unbridled development and to prevent special-interest group benefits at the expense of the public's interest. This democratic control is not likely to happen without extensive public participation. Such participation also is essential in bridging the gap between technical analysis and value-laden political decisions. Often, the issues must be resolved through public decisionmaking. Participants are reminded that the content of **Module 6: Education for Public Decisions** is relevant to many risk assessment situations. Several ways in which citizens can be involved are listed in Transparency 42.

PUBLIC PARTICIPATION ACTIVITIES FOR IMPACT ASSESSMENTS

1. GATHER DATA FROM AFFECTED PARTIES
2. INCLUDE INTERESTED PARTIES ON ADVISORY COMMITTEES
3. ENCOURAGE DIALOGUE REGARDING ALTERNATIVE PLANS
4. CONDUCT CITIZEN-CONTROLLED IMPACT STUDIES

TM-42

Point out that encouraging citizens to conduct their own impact research is important for situations in which government agencies are unresponsive; try to minimize or cover up embarrassing consequences; or receive limited resources to engage in risk assessments. People need to act to protect themselves. Refer to the content of **Module 3: Developing Leadership** and **Module 5: Working With Groups and Organizations.** State that the materials in these modules would be helpful to citizen groups in their participatory impact research.

Roles for Cooperative Extension Professionals (15 minutes)

Refer to the material in "Roles for Cooperative Extension" (Sourcebook, Unit IV). After this material has been discussed, ask participants to recall impact assessments in which Cooperative Extension has had some involvement. In addition, encourage them to nominate impact categories they consider high priority for assessment studies in their county or state. This discussion is summarized in Transparency 43.

ROLES FOR COOPERATIVE EXTENSION PROFESSIONALS

- WATCH FOR CONDITIONS THAT REQUIRE ASSESSMENTS
- ACT AS BROKERS BETWEEN CITIZENS AND TECHNOLOGISTS
- DISSEMINATE FINDINGS FROM IMPACT ASSESSMENTS
- FACILITATE DIALOGUE AMONG INTERESTED PARTIES ABOUT ALTERNATIVES

TM-43

Participants' attention should be brought to other groups that conduct impact assessments. For example, federal agencies that conduct risk studies are listed in "Groups That Conduct Impact Assessments" (Sourcebook, Unit IV). Encourage participants to share their knowledge of private research organizations, universities, and federal and state agencies that do similar work.

Summary: Prevention and Adaptation

Summarize the main concepts in Unit IV. Use the summary material in Unit IV of the Sourcebook. Indicate the sequence of topics that are to come:

Unit V. "Invention and Creation"

Unit VI. "Selecting Techniques"

Unit V. Invention and Creation

Suggested Format

The activities suggested for Unit V and the time to be devoted to each are as follows:

Introduction and Overview of Invention and Creation (20 minutes)

Preference Surveys (10 minutes)

Values Audits (20 minutes)

Images and Imaging (30 minutes)

Scenario Building (30 minutes)

Futures History Writing (30 minutes)

Action Planning (30 minutes)

Total time for Unit V—2 hours, 50 minutes

Materials Needed

Sourcebook, Unit V

Transparencies 44 through 53

TIP Sheets 7 through 12

Introduction and Overview of Invention and Creation (20 minutes)

Introduce Unit V by presenting or asking a participant to present a mini-lecture based on the ideas from Unit V of the Sourcebook.

It is recommended that you begin the mini-lecture with a summary of the differences among the four approaches to generating futures perspectives. The following mini-script can be used as a reference.

Display Transparency 44: "Definition of Invention and Creation Techniques" to accompany the lecture.

DEFINITION OF INVENTION AND CREATION TECHNIQUES

FUTURES-ORIENTED TECHNIQUES THAT BEGIN WITH THE CAPACITY OF INDIVIDUALS, GROUPS, AND ORGANIZATIONS TO INVENT AND CREATE IMPELLING GOALS AND IMAGES OF PREFERRED CONDITIONS AS THE BASIS FOR INFLUENCING THE FUTURE, THROUGH CHOICE.

TM-44

Mini-Script: Summary of Techniques Approaches

1. Anticipatory learning assumes a need to overcome resistance to viewing the future, and encourages learners to be open to futures literature, futures-oriented media, fictional futures, games and simulations, so that dialogue on ethics, values, and choices can take place.

2. The projection and forecasting approach to generating futures perspectives focuses on patterns, regularities, and continuities that can be projected into a potential future through historical study, trend extrapolation, crossimpact analysis, and the use of causal models

3. The prevention and adaptation approach to generating futures perspectives focuses on specific events, plans, technologies, or policies, for the purpose of assessing potential risk and identifying safe adaptations for the future.

4. The invention and creation approach to generating futures perspectives focuses on the capacity of persons to invent and create guiding visions, directing ideas, preferred conditions, and impelling goals toward which activity is to be directed, thus influencing the future by imagination and choice.

Suggest that participants, in groups of two or three, reflect on the extent that they already use any of the three "Generic Approaches to Invention and Creation" described in Unit V of the Sourcebook. These approaches are (1) elimination of obstructive patterns of thinking, (2) brainstorming, and (3) reflection on preferences and values. After personal reflection on these approaches to invention and creation, encourage participants to share their experiences within their small groups.

Use these experiences as a basis for introducing the six techniques for futures invention and creation. Transparency 45 can be used to show the focus of the content for Unit V.

Explain to the participants that, while each of these techniques can be used independently, images and imaging, scenario building, futures history writing, and action planning are techniques that were designed to be used in a sequence, with each technique building on prior work.

TECHNIQUES FOR FUTURES INVENTION AND CREATION

- PREFERENCE SURVEYS
- VALUES AUDITS
- IMAGES AND IMAGING
- SCENARIO BUILDING
- FUTURES HISTORY WRITING
- ACTION PLANNING

TM-45

Preference Surveys (10 minutes)

Introduce the preference survey technique with a mini-lecture, or ask a participant to do this. Base the comments on the content in "Preference Surveys" (Sourcebook, Unit V, and TIP Sheet 7).

In this mini-lecture, you should emphasize that a preference survey can be used to expand the involvement of persons in providing input into the creation of visions of the future that are desirable to pursue. A preference survey can be used to:

- Generate new images;
- Identify a broad range of alternatives in the planning process; and
- Determine the amount of support for specific images or plans.

Another important idea to be stressed is that preference surveys usually reflect major value differences embodied in personal, organizational, and technical perspectives. Most persons surveyed will reflect at least one of these perspectives. Preference surveys should attempt to elicit responses from those who are likely to differ according to these perspectives, so that a diversity of expression is assured.

Transparency 46 can be used as part of this mini-lecture to focus discussion and to assist the participants in designing an imaginary preference survey for any one of the five example situations described in Unit V of the Sourcebook. Assign these examples to small groups, or ask each small group to identify situations that participants think appropriate for a preference survey. You may want to call for reports from small groups on their application of preference surveys to specific situations.

PROCEDURES FOR CONDUCTING PREFERENCE SURVEYS

1. IDENTIFY THE FOCUS AND SELECT SAMPLES
2. SURVEY SAMPLE GROUPS
3. ANALYZE DATA AND COMPARE DIFFERENT PERSPECTIVES
4. IDENTIFY COMMON PREFERENCES
5. USE FINDINGS TO GENERATE DIALOGUE AMONG GROUPS
6. GENERATE ACTION PLANS CONSISTENT WITH COMMON PREFERENCES

TM-46

Values Audits (20 minutes)

Call the participants' attention to "Values Analysis" (Unit V, Sourcebook, and TIP Sheet 8). These materials can be read by participants and then discussed, or can be presented by you or a participant who has studied the materials in advance.

In the mini-lecture on values audits, emphasize that the purposes of a values audit are to:

- Identify basic positive values and images of the future for individuals or organizations;
- Reflect on value discrepancies and conflicts; and
- Engage in dialogue about ways to strengthen selected values that are at the core of the positive vision.

Transparency 47 can be displayed during the mini-lecture. Also described in Unit V of the Sourcebook is a procedure for conducting a values audit with individuals or families.

PROCEDURES FOR AN ORGANIZATION VALUES AUDIT

1. FORM A VALUES AUDIT STEERING COMMITTEE
2. CONDUCT A VALUES INVENTORY WITH AN EXTERNAL CONSULTANT
3. CONDUCT A VALUES ANALYSIS: DISTRIBUTE A REPORT
4. ENCOURAGE DIALOGUE THROUGHOUT THE ORGANIZATION
5. WRITE PAPERS ON SELECTED VALUES
6. ENCOURAGE A NEW VALUES CONSENSUS
7. INSTITUTIONALIZE NEW ORGANIZATIONAL PROCEDURES

TM-47

Suggest that the participants form groups of three or four persons to discuss the possibility of applying a values audit to the three example situations described in

Unit V of the Sourcebook. The participants may want to nominate other situations for using values audits.

Images and Imaging (30 minutes)

The technique for images and imaging is best introduced by following a mini-lecture from Unit V of the Sourcebook, "Images and Imaging," along with a participatory exercise.

In the mini-lecture, you should emphasize that the purpose of creating images of the future is to enable and motivate individuals, families, groups, organizations, and community leaders to invent a future; to help bring into existence a not-yet-occurred state of affairs; to fashion, to create, and to design new practices, new institutions, new ways of being and doing within the context of their concern.

Transparency 48 can be used to give participants an overview of the process. More detailed descriptions of the procedures appear in Unit V, Sourcebook; Handout 10; and TIP Sheet 9.

PROCEDURES FOR IMAGING

1. IDENTIFY PARTICIPANTS
2. IDENTIFY SPECIFIC CONCERNS ABOUT THE FUTURE
3. CLARIFY PARTICIPANTS' SPECIFIC CONCERNS
4. DEMONSTRATE IMAGING FROM PERSONAL MEMORY
5. GENERATE CONCRETE IMAGES IN GENERAL CATEGORIES
6. SHARE IMAGES IN SMALL GROUPS
7. INITIATE FOCUSED IMAGERY
8. RECEIVE FEEDBACK IN SMALL GROUPS
9. SEARCH FOCUSED IMAGES FOR CENTRAL THEMES
10. ENGAGE IN STORY TELLING IN LARGE GROUP
11. FORM COLLABORATIVE IMAGING TEAMS

TM-48

It is recommended that you take the participants through the first six procedures of the imaging technique. Emphasize that the process can produce many images, from which a selected few may be judged compelling enough to be the starting point for scenario building. Sharing images in small groups is important to emphasize, since articulating an image to others can help clarify it for the imager. Receiving feedback also stimulates creativity, if those providing it are not judgmental. You may have to demonstrate or model nonjudgmental feedback and encourage participants to practice it.

To get the participants to experience a demonstration of imaging from personal memory, ask them to spend at least one minute in silence thinking about times in their lives when they held a vision or a dream that motivated them. For some, it may have been the acquiring of a new possession—a toy, clothing, appliance, car, house. For others, it may have been something that they constructed or created. For still others, it may have been a career goal. Instruct them to share these experiences with each other in groups of two or three. Comment on the fact that they have already experienced the power of a vision, image, or goal that became for them a driving force in the shaping of the future.

Some participants may have difficulty with this process. All can benefit by practicing what Ziegler (1984) calls the "grammar of imaging." Transparency 49 can be displayed while participants are engaged in the imaging process.

Challenge the participants to identify situations in which Cooperative Extension and its publics could make effective use of the imaging technique. Six example situations in which imaging could be used are described in Unit V of the Sourcebook.

As an additional activity, ask small groups to describe how the process would work with example situations that each group identifies. The total group

THE GRAMMAR OF IMAGING

RULE 1. Be concrete and specific.

RULE 2. Do not interpret your image.

RULE 3. Yield to your images; let them flow.

RULE 4. Shift one or more variables or factors in your image and discover what happens.

RULE 5. Withhold plausibility and preference judgments about your images. Do not censor.

RULE 6. Return to your image when in doubt.

RULE 7. Feel the image. Internalize it.

RULE 8. Never force the image.

RULE 9. Always be prepared for new images.

RULE 10. Move into the time and place of the image and live it.

—Ziegler (1984)
TM-49

could hear short reports from each small group.

Scenario Building (30 minutes)

Explain to the participants that some of the images generated during the imaging process could serve as a basis for learning about scenario building. However, scenario building can be used in conjunction with projection and forecasting, as well as prevention and adaptation techniques. An introduction to scenario building is in Unit V of the Sourcebook. Transparency 50 can be displayed as part of the introduction to this technique.

DEFINITION OF A SCENARIO

A DETAILED DESCRIPTION OF THE
FUTURE NATURE AND SCOPE
OF
UNFOLDING POTENTIAL EVENTS,
OBJECTS, AND PROCESSES

TM-50

Explain that, in most cases, more than one scenario is elaborated, which gives a range of logically possible alternatives.

The essential elements in a scenario, according to Ziegler (1982a) are:

1. A clear statement or formulation of the goals of the intended action.

2. Imaginative indicators of the achievement of the goal so that we know, or can evaluate, when we have met our objectives.

3. A map of the consequences of the invention or intervention that sets forth the unintended effects or impacts.

4. A reasonably detailed description of the instruments that are designed to achieve the goal; the means, the methods, the strategies, and the consequences of their use.

5. A clear statement of the underlying assumptions, rationale, and values embedded in the scenario.

6. A description of the groups involved in and affected by the scenario.

Descriptions of scenario building procedures are in Unit V of the Sourcebook and TIP Sheet 10. Transparency 51 can be used to summarize those procedures.

PROCEDURES FOR SCENARIO BUILDING

1. Set forth a clear statement of the goal.
2. Imagine indicators for evaluating achievement.
3. Specify assumptions, values, rationale.
4. Describe persons or groups affected.
5. Identify planning decisions.
6. Select several scenario logics.
7. Elaborate alternative scenarios.
8. Describe means, methods, and strategies.
9. Identify the decision implications of each scenario.

TM-51

Although there is not enough time during this workshop for the participants to complete a scenario, it is recommended that they begin the process for a specific situation. A selected image, generated from the imaging process previously described, could be the starting point for building a scenario. Three example situations that could be the starting point for building a scenario are described in Unit V of the Sourcebook. Encourage participants, working in small groups, to imagine what a scenario building process could be for at least one example situation. The product of their work in small groups could be shared with the total group.

Futures History Writing (30 minutes)

You, or a participant who has prepared in advance, provide a mini-lecture on "Futures History Writing," using the background information in Unit V of the Sourcebook and TIP Sheet 11.

Provide a brief definition of futures history writing, its purpose, and an introduction to the procedure.

Explain to the participants that futures history writing is a unique way of making a transition from scenarios to action plans. The technique builds on the concept of the "future present moment," the capacity to put oneself into a specific time and place in the future and to live that future as if it were the present. Through imagination, the intended future has happened. While standing firmly in that future place and time, in the actuality of our minds, we ask, "How did all of this [the scenario] come about? How did it happen?" The technique is a special form of imaging and requires the application of the rules described in Transparency 49: "The Grammar of Imaging."

THE GRAMMAR OF IMAGING

RULE 1. Be concrete and specific.

RULE 2. Do not interpret your image.

RULE 3. Yield to your images; let them flow.

RULE 4. Shift one or more variables or factors in your image and discover what happens.

RULE 5. Withhold plausibility and preference judgments about your images. Do not censor.

RULE 6. Return to your image when in doubt.

RULE 7. Feel the image. Internalize it.

RULE 8. Never force the image.

RULE 9. Always be prepared for new images.

RULE 10. Move into the time and place of the image and live it.

—Ziegler (1984)
TM-49

State that the purpose of futures history writing is to generate conscious awareness of the wide range of events and happenings that is likely to link the intended future image or scenario to the present, and to view those events and happenings in some ordered, sequential stages of development.

You may want to use Transparency 52: "Procedures for Futures History Writing," to summarize or to lead an exercise to demonstrate the process.

PROCEDURES FOR FUTURES HISTORY WRITING

1. Place oneself in the future and imagine that the intended future has happened. Then ask, "How did it happen?"
2. Compile, through imaginary memory, a list of specific concrete events.
3. Record the events into a plausible historical record according to time periods.
4. Review the future history document for discontinuities and gaps.
5. Return to imaging to create new material, as necessary.
6. Share documents with other participants and receive feedback.
7. Collaborate on creating futures history documents around common scenarios.

TM-52

Encourage participants, as individuals or in small groups, to attempt a short futures history writing episode to experience at least the first step in the process. Two example situations that can be used for this activity are in Unit V of the Sourcebook. Participants may want to select their own example situations.

Ask participants to report their experiences in the first step in the futures history writing process.

Action Planning (30 minutes)

In a mini-lecture that introduces action planning, point out that all of the information generated through the techniques described in this Module should be viewed as part of efforts to analyze situations and to take steps toward action. The content in **Module 4: Situational Analysis,** and in **Module 2: The Extension Education Process** provides a broad framework for action planning on the part of the individuals, families, groups, and organizations, and, in some cases, whole communities. Learners are encouraged to review that process, and to appreciate the way that all of the techniques for viewing the future described in this Module contribute to it. Some of the planning techniques that have been associated specifically with futures invention approaches are described in "Action Planning" (Sourcebook, Unit V, and TIP Sheet 12).

State that the purpose of action planning is to help the futures inventor begin to live the intended future in the present, through setting short-term objectives, identifying action groups, analyzing enhancers and inhibitors, identifying resources, and designing instruments and action. Transparency 53 can be displayed as an outline for the mini-lecture.

Suggest that participants take one of the example situations with which they have been working and, in small groups, select one or more of the action-planning procedures and produce a part of an action plan. Unit V of the Sourcebook is to be used for more detailed procedures.

PROCEDURES FOR ACTION PLANNING

1. SET SHORT-TERM OBJECTIVES
2. IDENTIFY ACTION GROUPS
3. ANALYZE ENHANCERS AND INHIBITORS
4. IDENTIFY RESOURCES
5. DESIGN INSTRUMENTS AND ACTION

TM-53

Summary: Invention and Creation

Summarize the unit on invention and creation approaches, or lead a discussion to draw from participants the advantages and limitations of the use of these techniques. Transparency 45 can be used for this summary.

TECHNIQUES FOR FUTURES INVENTION AND CREATION

- PREFERENCE SURVEYS
- VALUES AUDITS
- IMAGES AND IMAGING
- SCENARIO BUILDING
- FUTURES HISTORY WRITING
- ACTION PLANNING

TM-45

Point out that there is one remaining unit in Module 7.

Unit VI. Selecting Techniques for Futures Perspectives

Suggested Format

The activities suggested for Unit VI and the time devoted to each are as follows:

Summary of Techniques (10 minutes)

What to Consider When Selecting Techniques (40 minutes)

Videotape, "Tomorrow Starts Today" (40 minutes; optional here)

Self-Assessment and Workshop Evaluation (10 minutes)

Total time for Unit VI (not including videotape)—1 hour

Materials Needed

Sourcebook, Unit VI

Transparencies 17, 24, 31, 44, 54, and 55.

Handouts 10 and 11.

Relationships Among Approaches

Begin Unit VI by clarifying its purposes. Participants will learn to:

1. Understand relationships among the four approaches to generating futures perspectives;

2. Make selections among techniques for example situations; and

3. Assess their own understanding of the techniques and evaluate the workshop's usefulness for their work.

Display the four transparencies that were used earlier as introductions to each of the four approaches: 17, 24, 31, and 44.

TECHNIQUES FOR ANTICIPATORY LEARNING

- SELF-DIRECTED LEARNING: FUTURES LITERATURE
- VISUAL REFLECTION: FUTURES-ORIENTED MEDIA
- READING AND DIALOGUE: FICTIONAL FUTURES
- FUTURES GAMES AND SIMULATIONS

TM-17

While each of these transparencies is being displayed, summarize the purposes for each approach:

TECHNIQUES FOR PROJECTION AND FORECASTING

- HISTORICAL PRECEDENT
- DELPHI ANALYSIS
- TREND EXTRAPOLATIONS
- CROSS-IMPACT ANALYSIS
- COMPUTER USES AND LIMITATIONS

TM-24

- Anticipatory learning: to awaken us to the necessity and benefits of learning to think with a futures orientation.

CATEGORIES OF IMPACT ASSESSMENT

- ECONOMIC IMPACT ASSESSMENT
- TECHNOLOGY IMPACT ASSESSMENT
- ENVIRONMENTAL IMPACT ASSESSMENT
- SOCIAL IMPACT ASSESSMENT

TM-31

- Projection and forecasting: to examine the implications of future trends and projections upon our activities.

DEFINITION OF INVENTION AND CREATION TECHNIQUES

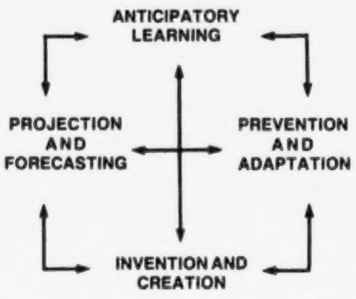
FUTURES-ORIENTED TECHNIQUES THAT BEGIN WITH THE CAPACITY OF INDIVIDUALS, GROUPS, AND ORGANIZATIONS TO INVENT AND CREATE IMPELLING GOALS AND IMAGES OF PREFERRED CONDITIONS AS THE BASIS FOR INFLUENCING THE FUTURE, THROUGH CHOICE.

TM-44

- Prevention and adaptation: to prevent undesirable, hazardous, or unintended outcomes.
- Invention and creation: to invent, create, and focus new visions, possibilities and goals for a desirable future that will motivate activity and attract resources.

Point out that the four approaches can be viewed as distinct, but also complementary. They should be viewed as relating to one another on the same level, rather than in some sort of hierarchy or preferred sequence. This concept is displayed in Transparency 54. Ask participants to think of example situations in which more than one of the approaches could be used to advantage.

RELATIONSHIPS AMONG APPROACHS FOR FUTURES PERSPECTIVES



TM-54

What to Consider When Selecting Techniques (30 minutes)

Refer to the content of "Selecting Techniques for Futures Perspectives" in Unit VI of the Sourcebook, in which are described seven variables or aspects of situations that usually have a bearing on selecting appropriate techniques. You may use Transparency 55, while briefly describing how each factor could affect the selection of a technique.

WHAT TO CONSIDER WHEN SELECTING TECHNIQUES

- PURPOSE
- PROBLEM CHARACTERIZATION
- NATURE AND EXTENT OF AVAILABLE INFORMATION
- SCOPE OF THE SITUATION
- URGENCY OF THE SITUATION
- TIME FRAME
- LEVEL OF PARTICIPATION

TM-55

While displaying Transparency 55, ask the participants to select situations at random, or those that interest them, and then to undertake the tasks described in Handout 14: "Steps to Consider While Selecting Techniques for Futures Perspectives." This activity can be undertaken by individuals working independently or by pairs or triads. Some of the participants may want to work on situations with which they are familiar, or ones they intend to address in the near future.

You will want to leave enough time for participants to report the results of their selection analysis. These reports can be the basis for discussion and integration of the central concepts learned during the entire workshop. Encourage participants to clarify Cooperative Extension's role in each of the example situations.

[*Note:* If the videotape, "Tomorrow Begins Today," was not shown earlier, it may be shown at this time.]

Self-Assessment and Workshop Evaluation (10 minutes)

One of the preworkshop assignments was the use of the Handout 2: "Self-Assessment Instrument—Knowledge of Techniques for Futures Perspectives." Encourage participants to use the same instrument for a second self-assessment or posttest. They are to note the extent of their new knowledge and understanding in comparison to what they knew at the outset of the workshop. This activity is a positive experience, for most persons, since the workshop activities directly relate to each item on the self-assessment instrument.

In addition to using the self-assessment instrument, the participants should be asked to provide evaluation feedback on the workshop itself. Handout 15: "Workshop Evaluation—**Module 7: Techniques for Futures Perspectives** can be used to gather this information.

Remind the participants that it would be helpful if they let you know over the next few months if they used these techniques for futures perspectives with Cooperative Extension or its publics. In addition, offer to provide consultation to participants in their efforts to make use of the techniques. Any arrangements for obtaining additional copies of the workshop material can be announced at this time.

After you collect the "Workshop Evaluation" forms, close the workshop by asking each participant to think of one word or phrase that best describes his or her experience in the workshop.

Working With Our Publics

Module 7: Techniques for Futures Perspectives

Learners' Packet

Developed by: J. David Deshler, Associate Professor
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Handout 1
Touring Futures II — A Literature Guide to Futures Studies for Cooperative Extension

By **Michael Marien**

Introductory Note

''Touring Futures: An Incomplete Guide to the Literature,'' was originally published in *The Futurist* (April 1983, pp. 12–21). Toward the end of the essay, I predicted that ''unlike a street map of London or a field guide to trees or birds, a guide to futures literature is likely to become obsolete in only a few years.'' Regrettably, I was correct. This updated and revised guide bears little resemblance to the 1983 edition. In part, it reflects a slanting to the Cooperative Extension audience. And I am older and, hopefully, somewhat wiser. But it also reflects how much our thinking about the future has changed in the past four or five years, as new issues and ideas crowd out the old.

Two diametrically opposed but towering figures in futures studies, Herman Kahn and Buckminster Fuller, both died in 1983, within six days of each other. The high-tech, corporate-centered culture of the 1980s has superseded the appropriate tech, back-to-the-land 1970s. The image of American farmers serving as breadbasket to the world—the basis of agricultural policy in the late 1970s—has been turned upside-down by the reality of food surpluses in many countries. The fearsome spread of AIDS, a development that was utterly unanticipated by anyone in any way, now threatens to be a—if not *the*—major problem of the 1990s. The reader, therefore, is warned that this literature guide, in turn, may be outdated by the early 1990s. But it is the best that can be done, at this time, to assess the books that give us a ''big picture'' of what is changing, where we may be headed, and what we should do.

Touring Futures II

The loosely defined ''field'' of futures studies (or future studies, or futures research) is supported by a vast literature covering a wide variety of topics, and an equally wide variety of people who have something to offer, whether or not they are ''futurists.'' Thus, there are many answers to the questions of ''what is good futures reading?'' and ''Where should I start?''

Touring futures is similar to touring a foreign country. One can take a short trip or a long trip. One can take a packaged tour (a course or program), or discover it oneself in ad hoc fashion. One can spend a lot of money, or relatively little. And one can have a fabulous learning experience, or end up wasting time, getting ripped off, and feeling cheated.

Seven Tips for Tourists

To make the most of whatever time or money you spend, consider the following tips:

1. There are no qualifications to be a "futurist." For better or worse, a futurist is someone who says that he or she is a futurist, or is seen as such. There are no Ph.D. programs and no "bar exams"—it is a wide-open game, played by a variety of rules. Some who call themselves futurists have wise and intelligent things to say about what is happening; where we are headed; and what we must do. Others, in my opinion, are selling trivial or half-baked ideas, if not outright "snake oil." At the same time, there are many people who do not call themselves futurists who also have worthwhile contributions. In other words, you cannot tell the good players by their labels.

2. There is no futures "field." Let us quickly demystify the so-called "field," and notions of a "priesthood" of computer modelers or think-tank geniuses. There are only several hundred "professional futurists" in the United States (see *The Futures Research Director: Individuals*, World Future Society, 1987), with widely varying backgrounds, interests, and credentials. Futures studies is not a "field" in the traditional sense (such as the field of nutrition), because its practitioners do not have a common educational background, nor common interests. The great majority of these futurists do not use computer models or arcane quantitative techniques (doing so does not necessarily make one wiser). And the people in think tanks (which are mere offices, not "tanks" of any sort) are simply specialized researchers (sometimes specialists in certain generalities) who are not notably smarter than people in universities, schools, and businesses. Thinking about the future can be seen as a "horizontal speciality," or specializing in breadth instead of depth. If you encounter someone who claims to know all the answers, it is virtually certain that he or she is playing guru and, in fact, has little to offer. Many people seek gurus with all the answers; in our uncertain age, religion is as strong as ever. But good futures thinking often has more to do with generating the right questions, rather than making predictions or forecasts.

3. There are no magic techniques. To the uninitiated, it might seem that the quick way to capture some insight into the future is through some technique such as computer models, Delphi, cross-impact analysis, or econometric forecasting. As already stated, only a few futurists use computer models. If interested in the problems and promises, look at Donella Meadows, John Richardson, and Gerhart Bruckmann (1982), *Groping in the Dark: The First Decade of Global Modeling.* The Delphi technique is frequently associated with futurists, and potentially can elicit collective judgment in certain areas. But, regrettably, it is not, in fact, used very often because it is tricky and expensive. If interested in the technical details, see Harold A. Linstone and Murray Turoff (1975), *The Delphi Method: Techniques and Applications.*

To understand future problems and possibilities, the most elementary and fundamentally important "technique" is simply to read a variety of good books and to stay up to date. Reading and common sense may lack the dazzle of elegant technique, but too often the "techno-dazzlers" are ignorant of any basic literature. After reading at least a sample of books (do not let any single author be your guru), you might consider sketching a handful of contrasting scenarios: positive and negative, probable and preferable. A good, up-to-date introduction is provided by Steven P. Schnaars (1987) in, "How to Develop and Use Scenarios."

Learning about future problems and possibilities is the same as learning about any professional field or academic discipline: there is much to learn; there is a vast literature; and one should not expect any sudden expertise. One does not become a doctor, a chemist, or a mechanic without considerable learning. Any adult can and should know something about health, drugs, and automobiles. Similarly, any adult can acquire some basics about the future of organizations, communities, the United States, and the world.

4. Distinguish between forecasts and proposals. The world of futures thinking can be loosely divided into descriptive futures (forecasts of what is possible or probable) and prescriptive futures (advocacy of what is preferable in the future, or what future condition we would like to realize). Both are important. Indeed, one without the other diminishes our sense of possibilities. Mere forecasting of what may happen (which is frequently heavily biased) deflects attention from preferable or normative futures that could be realized. But focusing only on preferable futures can make us lose sight of future realities that are not necessarily desirable.

To illustrate in the highly controversial area of future energy, any forecast on the future of nuclear power is likely to be highly biased, depending on whether or not one favors this option. Pro-nuke people envision an important role for nuclear power in the twenty-first century (perhaps with modifications for improved safety), while anti-nuke opponents say that the industry is dying and on the path to oblivion because it is too costly and inherently unsafe. Pro-nuke people see little role in renewable energy and ignore possibilities for conservation, while anti-nuke people see great potential for both, if given a mere fraction of the subsidy and research and development support that has been given to nuclear power. As a *preferable* future, is it better to emphasize nuclear power or conservation and renewables? And better for whom? But realizing the immense investment and lobbying power of the nuclear power industry, which option is *likely* to prevail?

5. Avoid Pollyanna and Cassandra. The appeals of both techno-utopians and social-utopians are attractive. We frequently hear that such-and-so technology will be upon us in only a few years, with "revolutionary" consequences. Or such-and-so movement is rapidly gaining adherents (such forecasts are invariably made without mentioning any numbers) and will be a major force very soon. The Pollyanna view is especially embraced because Americans, in particular, are prone to think positive and avoid the negative. There is also a market for the dire forecast, e.g., that economic collapse will take place in the next few years [Ravi Batra (1987), *The Great Depression of 1990*]. Most people would agree that such a calamity is *possible*, but neither probable nor likely. Both Pollyanna and Cassandra exaggerate and simplify to make their case and, therefore, are more prone to gain media attention. But both are generally less likely to be accurate as forecasters. An excellent review of techno-utopian thinking is provided by Joseph J. Corn (1986). *Imagining Tomorrow: History, Technology, and the American Future*. Corn concludes that the vision of the future as a technological paradise has been a central theme in American culture. Even now, many think that Star Wars will be the technological fix for the arms race!

6. Futures thinking is subversive, conserving, and amusing. Nearly two decades ago, Neil Postman co-authored a book entitled, *Teaching As a Subversive Activity.* Several years later, he published *Teaching As a Conserving Activity;* and in his most recent book, *Amusing Ourselves to Death* (Postman, 1985), he describes education as an ''amusing activity'' in order to emulate TV. Similarly, thinking about the future can be subversive of established notions, conserving of our values, and amusing (as an escape from the real world, for better or worse). The entire science fiction industry can be seen as an amusing diversion into the future, with only an occasional idea that might help us to anticipate real-life futures or shape desirable futures.

Despite the small number of professional futurists and college programs in futures studies, many people think about the future because they must. Futures thinking can be found in some form, for better or for worse, in every discipline, profession, and industry: there are alternative futures (possible and desirable) for education, law, agriculture, health care, communities, families, and Planet Earth. Some of these ideas are conventional ''establishment'' ideas; others are unconventional, from outside the establishment. Our era of uncertainty and multiple transformations itself is unconventional and subversive. And thus some establishment ideas are necessarily unconventional. And, conversely, some counterestablishment ideas are tired, conventional, out of date. Like any wise traveler in foreign lands, those who tour the futures landscape should stay alert.

7. Most forecasts are likely to be wrong. To reiterate, the times are uncertain and changing rapidly. Even weather forecasters are wrong some of the time. Forecasts of social, economic, political, and cultural futures are wrong much of the time. This does not mean that we should cease thinking about the future, but only that we must approach the topic with modesty and reasonable expectations. We do not expect a baseball player to get a hit every time at bat; a good player hits only three times in ten (.300), while a poor player hits less than two times in ten. If a good futurist does make a forecast (he or she is just as likely simply to be raising questions about the present), the forecast is more likely to be accurate than that made by someone who has not reflected on the forecasted topic. But futurists are by no means infallible—nor do they ever make such claims. Some thinking about the future is better than no thinking; just remember that constant revision of outlook is required.

Four Tours

Armed with these tips for successful touring, four general areas should be considered for at least a short visit: overviews, society and technology, natural resources, and human resources.

1. Bird's-Eye View: Overviews and Introductions

When visiting a city for the first time, many tourists take an overview tour of the highlights to ''get the lay of the land.'' Similarly, in touring futures literature, it might be wise to start with several overviews and introductions.

The best place to start may well be with *Future Survey Annual 1986* (the latest edition available), which brings together abstracts of books, reports, and articles on trends, forecasts, and proposals that have been published in the monthly *Future Survey.* More than 8,000 abstracts have been published since 1979 in seven annual volumes (available from the World Future Society, 4916 St. Elmo Avenue, Bethesda, Md. 20814). Another 1,000 abstracts will have been published as of December, 1987, most of them to be included in *Future Survey Annual 1987,* due in early 1988. Basic categories in the annual volume include World Futures, International Economics, World Regions and Nations, Defense and Disarmament, Energy, Environment and Resources, Food and Agriculture, Society and Government, The U.S. Economy, Work, Spatial Affairs (communities, housing, transportation), Justice, Health, Families and Education, Communications, Science and Technology, and Methods to Shape the Future. These 17 basic categories are subdivided into 67 subcategories.

After a quick tour of this directory to get some idea of the variety of futures-relevant literature, you will be ready to read some individual volumes. Some readers of "Touring Futures II" may be using the *Future Survey Annual* and copies of the monthly *Future Survey* not yet incorporated into the annual, which gives them the option of looking at the longer abstract or review of the book before attempting to acquire the book itself. (Many of the books mentioned here are available from the World Future Society Book Service, 4916 Elmo Avenue, Bethesda, Maryland 20814. WFS publishes a free annual catalog listing several hundred titles for sale.)

The standard introduction to futures studies, and still a good starting point, although a bit outdated, is *The Study of the Future* by Edward Cornish (1977), president of the World Future Society. Cornish is editor of *The Futurist,* a general bimonthly magazine sent to all members of WFS (membership open to anyone). Another good starting point still worth considering is *The Art of Conjecture,* by the late Bertrand de Jouvenel (1967), a French political philosopher. Unfortunately, this seminal volume has been out of print for many years, but you can doubtless get it through interlibrary loan. Another "oldie-but-goodie" is the massive 822-page *Handbook of Futures Research,* edited by Jib Fowles (1978), who amassed 41 essays on a variety of methods, along with somewhat dated overviews of substantive areas.

The most recent noteworthy literature on futures methods includes *What I Have Learned: Thinking About the Future Then and Now,* edited by Michael Marien and Lane Jennings (1987). This unique volume features 16 essays by leading thinkers such as Kenneth Boulding, Amitai Etzioni, and Willis Harman, as well as a selected bibliography of the "classics" of futures literature over the past 20 years. Also worthwhile is *Ideas About the Future: A History of Futurism, 1794–1982,* by Burnham P. Beckwith (1986), which offers critical essays on 25 futurist writers. The best recent introduction to methods is provided by three Swedish futurists: *Methods in Future Studies,* by Brita Schwartz et al. (1983).

Thinking about the future is not the same as acting to shape the future, and much recent literature has stressed the essentials of good action: leadership, strategic planning, and problem solving. John W. Gardner (1981), the author of *Self-Renewal* and other seminal volumes, is now the director of the Leadership Studies Program at Independent Sector (1828 L Street NW, Washington DC 20036). As of this writing, he has issued seven highly recommended *Leadership Papers,* surely to become an important book in a

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year or so. The last chapter of *Families in Peril: An Agenda for Social Change,* by Marian Wright Edelman (1987), offers wise advice for would-be leaders in any area. *Thinking Strategically: A Primer for Public Leaders,* by Susan Walter and Pat Choate (1984), is an excellent primer on five components of strategic management: foresight, goal setting, strategic planning, operational management, and evaluation. *The IDEAL Problem Solver: A Guide for Improving Thinking, Learning, and Creativity,* by John D. Bransford and Barry S. Stein (1985), also focuses on five "IDEAL" elements: identifying problems; defining them; exploring possible strategies; acting on them; and looking back and evaluating.

Acknowledging and understanding social change is increasingly important. Many readers of this essay are undoubtedly familiar with two best-sellers from the early 1980s: Alvin Toffler's frenetic *The Third Wave* (1980) and John Naisbitt's (1982) immensely popular, upbeat, but highly superficial *Megatrends: Ten New Directions Transforming Our Lives.* This feel-good tract was later complemented by the highly pessimistic views of former Colorado governor Richard D. Lamm (1985) in *Megatraumas: America at the Year 2000.* Two recent contributions, both focused on managing change and crisis, are *Mastering Change: The Key to Business Strategy,* by Leon Martel (1986), and *The Rapids of Change: Social Entrepreneurship in Turbulent Times,* by Robert Theobald (1987). Martel's book is bland in style, but is valuable for distinguishing between irreversible structural changes and temporary cyclical changes. Theobald takes a more worried view, in his popularized introduction to diversity, complexity, and uncertainty.

2. Society and Technology

The second recommended tour is only slightly less general in its outlook, bringing together broad views of society and technology.

Start with some general works on social trends. A British consulting group, Oxford Analytica (1986), offers a balanced view of social, political, and economic trends in *America in Perspective: Major Trends in the United States Through the 1990s. The American People,* by Bryant Robvey (1985), describes 10 demographic trends, such as the maturing baby-boom generation, a widening earnings gap, new living arrangements, and women as an increasingly important force. Two recommended books concentrating on the changing role of women are *The Economic Emergence of Women,* by Barbara R. Bergmann (1986), and the somewhat overstated *The Feminization of America: How Women's Values Are Changing Our Public and Private Lives,* by Elinor Lenz and Barbara Myerhoff (1985). Broad trends in crime are described in *Crimewarps: The Future of Crime in America,* by Georgette Bennett (1987), e.g.: older criminals, more white-collar crime, legislation of some "consensual crimes," and more effective crime-fighting strategies that displace some civil liberties.

The newest pattern of settlement is at the outer fringes of metropolitan areas and around small towns removed from large cities, as described by John Herbers (1986) in *The New Heartland: America's Flight Beyond the Suburbs and How it is Changing Our Future.* Focus on the new suburbia is provided by *Trouble in Paradise: The Suburban Transformation in America,* by Mark Baldassare (1986). *The Malling of America,* by William S. Kowinski (1985), describes flourishing shopping malls as the new town center. Normative works or prescriptive futures focusing on communities include *Regenerating America: Meeting the Challenge of Building Local Economies,* by Medard Gabel et al. (1985); *Reviving Main Street,* edited by Deryck Holdsworth (1985); and *Sustainable Communities: A New Design Synthesis for Cities, Suburbs, and Towns,* edited by Sim Van der Ryn and Peter Calthorpe (1986), which places priority on long-term social and ecological health.

Many changes also are taking place in the workplace. William E. Halal (1986) describes *The New Capitalism* as democratic free enterprise with more participation in decisionmaking. Colin Gill (1985) warns that full employment can no longer be guaranteed, in *Work, Unemployment, and the New Technology,* similiar to an earlier overview by Australian Minister for Science Barry Jones (1982) in *Sleepers, Wake! Technology and the Future of Work.* For those concerned with human services, *The Self-Help Revolution,* edited by Alan Gartner and Frank Riessman (1984), explores issues of how professionals can best interact with emerging self-help and mutual-aid groups in a wide variety of areas. On a more normative level, *Future Work: Jobs, Self-Employment, and Leisure After the Industrial Age,* by James Robertson (1985), advocates a ''sane, humane, ecological future,'' in which paid and unpaid work are shared more equally among men and women, and small-scale technology enables people to do more for themselves in the nonmeasured ''informal economy.''

Technology is booming in the 1980s, and will surely have many impacts on our future society. Information technology is the most visible of several broad techno-revolutions. A good introduction is *The High-Tech Society: The Story of the Information Revolution,* by Tom Forester (1987). Forester (1985) also edited *The Information Technology Revolution* on the computer revolution and its impact on work and society. *Silico Sapiens: The Fundamentals and Future of Robots,* by Joseph Deken (1986), offers an authoritative and provocative view of robotics as the final step in computer evolution. *The Silicon Society,* by David Lyon (1986), is a thoughtful primer addressed to Christians on ethical questions introduced by the microchip.

The biotechnology revolution also has raised a host of ethical questions, thoroughly addressed by a British panel in *A Question of Life: The Warnock Report on Human Fertilisation and Embryology* (1985). A more general view of the expanding horizon of biological understanding can be found in *Bioburst: The Impact of Modern Biology on the Affairs of Man,* by Richard N. Re (1986). A lush but acritical coffee-table book, with more than 150 color photographs of recent developments, is provided by Elizabeth Antebi and David Fishlock's (1986) *Biotechnology: Strategies for Life;* this book is rather present-oriented, though. A stunning future-oriented view of possibilities, also with more than 150 photos and drawings, is offered by Brian Stableford (1984) in *Future Man.*

The new technology in these areas and others is awesome, for better or for worse. But how can we get a grip on science and technology and encourage good applications while discouraging questionable developments? Technology is too important to be left to the political, commercial, and scientific elite, argues former presidential science advisor Edward Wenk, Jr. (1986), in *Tradeoffs: Imperatives of Choice in a High-Tech World.* Wenk asserts that citizens do not need a background in science to understand how it affects their lives—and there is no evidence that technical knowledge freely translates into social wisdom. Citizen involvement in science policy also is promoted by *Citizen Participation in Science Policy,* edited by James C. Peterson (1984).

3. Natural Resources

All of the aforementioned books on society and technology have a serious blind spot: they ignore the growing incursion of humanity on the natural environment through pollution, deforestation, desertification, soil erosion, climate alteration, and growing demands for previously abundant resources, such as fresh water. Increasingly, the environment and resources dimension to human affairs will demand attention. (Ignoring these matters simply pushes the problem into the future, at which time it will be even worse.)

It may be useful to start with at least one of several global overviews. *Our Common Future* (1987), issued by the UN-initiated World Commission on Environment and Development, warns of the growing gap between rich and poor nations and of environmental trends that threaten to alter the planet radically, and clearly makes the case for "sustainable development." *State of the World 1987: A Worldwatch Institute Report on Progress Toward a Sustainable Society,* an annual effort by Lester R. Brown et al. (1987), also warns of many systems vital to the earth's habitability that are out of equilibrium simultaneously, and that living conditions are deteriorating for one-half of the world's population. *World Resources 1987: An Assessment of the Resource Base That Supports the Global Economy,* (1987), an annual effort by the International Institute for Environment and Development and the World Resources Institute, provides up-to-date data and analyses of population, food and agriculture, forests and rangelands, wildlife, energy, fresh water, and human settlements. The World Resources Institute also has sponsored the Global Possible Conference that focuses on necessary action for sustainable development. This is summarized in *World Enough and Time: Successful Strategies for Resource Management,* by Robert Repetto (1986), who emphasizes five basic areas: a priority on least-cost options and basic services, managing common resources, proper resource pricing, designing for efficiency, and building management capability.

On domestic issues, the *State of the Environment* (1984), report from the Conservation Foundation is thorough and well balanced (a new edition is expected in late 1987). *Renewing America: Natural Resource Assets and State Economic Development,* by William E. Nothdurft (1984), describes actions that states can take to halt soil erosion, groundwater depletion, deforestation, and salinization of cropland. The Office of Technology Assessment, an agency of the U.S. Congress, has issued important reports on *Protecting the Nation's Groundwater From Contamination* (1984), *Transportation of Hazardous Materials* (1986), and *Superfund Strategy* (1985) on cleaning up the 10,000 toxic waste sites in the United States. The Worldwatch Institute in Washington has also issued a number of important papers on environment and resource issues, such as *Electricity's Future: The Shift to Efficiency and Small-Scale Power*, by Christopher Flavin (1984), *Conserving Water,* by Sandra Postel (1985), *Mining Urban Wastes: The Potential for Recycling,* by Cynthia Pollock (1987)), and *Reassessing Nuclear*

Power: The Fallout from Chernobyl, by Christopher Flavin (1987), on the declining nuclear power industry worldwide, and the growing hazard of aging plants that are showing signs of deterioration.

Our energy problems, unfortunately, are far from over. *The Power Makers,* by Richard Munson (1985), describes how one-third of all Americans will soon experience rate shocks. Economist John O. Blackburn, (1987), in *The Renewable Energy Alternative,* clearly demonstrates how the United States and the world can get to a renewable energy future without increasing their reliance on coal or nuclear power. *Beyond Oil: The Threat to Food and Fuel in Coming Decades,* by John Gever et al. (1986), warns that world oil production will probably peak around the year 2000, and that oil-dependent U.S. agriculture can only be sustained if land degradation is reversed.

But will land abuse be halted? *Eroded Soils: The Off-Farm Impacts,* by Edwin H. Clark, II, et al. (1985), warns that America's lands are eroding at substantial rates, requiring more effective economic incentives and regulation. In *Soil and Survival: Land Stewardship and the Future of American Agriculture,* Joe Paddock et al. (1986) advocate a spiritual and ethical vision of interconnectedness with the land. A similar view of the small-scale healthy farm is advocated by poet and farmer Wendell Berry (1977, 1986) in *The Unsettling of America: Culture and Agriculture.* This may be desirable, but the more likely future is that an additional one million farms will disappear by the year 2000, according to the Office of Technology Assessment report, *Technology, Public Policy, and the Changing Structure of American Agriculture* (1986). In contrast to the humane, ecological view of agriculture, acritical high-tech visions of the future are described in *Agriculture 2000* (1983), by the Battelle Memorial Institute, and *Agriculture in the Twenty-First Century,* edited by John W. Rosenblum (1983). A responsible and readable critique of technology and agriculture is made by Jack Doyle *(1985), in Altered Harvest: Agriculture, Genetics, and the Fate of the World's Food Supply.*

Are these broad issues studied and debated in schools of agriculture today? If not, will they be a required or an elective part of tomorrow's curriculum so as to encourage better-informed citizens? As a descriptive forecast, it does not seem likely; as a prescription of a desirable future, though, it would certainly seem as important as anything now taught. (Perhaps this seed of thought might help to create a better future; sometimes, it happens that way!)

And let us not forget one additional dimension: even as we experience a world food glut and a massive and painful shakeout in U.S. agriculture, up to 20 million Americans may be hungry at some time in any monthly period, according to the Harvard-based Physician Task Force on Hunger in America in their report on *Hunger in America: The Growing Epidemic* (1985). In an update of this book, Task Force Chairman J. Larry Brown (1987) suspects that the problem of hunger in America has grown worse.

4. Human Resources

The topics of food and hunger lead to the fourth and final "tour" of literature on human resources.

Millions of Americans are poor and hungry, but the great majority is not. Of this well-fed majority, some are overfed, but many are increasingly concerned about their health and dietary practices. Complementing this growing interest in self-care and preventive health practices, modern medicine has brought forth a plethora of tools and techniques to cure illness and affliction. But these come at great and growing cost, and health-care expense remains as a major issue.

Former HEW Secretary Joseph A. Califano, Jr. (1986) lucidly describes these problems in *America's Health Care Revolution*, and prescribes changes, such as staying out of the sick–care systems, consumer cost-consciousness, hospital efficiencies, and a redirection of research. In *Medical Care, Medical Costs*, Rashi Fein (1986) forecasts that inflated health-care costs, once an obstacle to national health insurance, will become its catalyst. The American Assembly volume on *Health Care and Its Costs,* edited by Carl J. Scramm (1987), recommends a strong public and private effort to reduce the long-term growth of health-care spending.

Cost control in health care will become even more urgent with the added burden of AIDS. Dozens of books are already available on AIDS (none, however, are particularly futures-oriented). Two of the best are *AIDS: Facts and Issues,* edited by Victor Gong and Norman Rudnick (1986), and *What to Do About AIDS,* edited by Leon McKusick (1986). Many more AIDS books are in the pipeline, however, offering updated views. Keep your eye on this problem: the worldwide AIDS epidemic could be the major issue of the 1990s. A forthcoming article in *The Futurist* will warn that America's net population could decline in the 1990s as a result of deaths from AIDS.

"The future of a society may be forecast by how it cares for its young," according to Senator Daniel P. Moynihan (1986), in *Family and Nation* , and there is much to worry about, in that one child in five lives in poverty. With more women in the labor force, a national family policy is advocated in *Family and Work: Bridging the Gap,* edited by Sylvia Ann Hewlitt et al. (1986). *In Support of Families,* edited by Michel W. Yogman and T. Berry Brazelton (1986), is the warning that the number of children in circumstances of high risk is increasing. David Elkind (1984) points to a "staggering" number of teenagers who have not made a healthy transition to adulthood, in *All Grown up and No Place to Go: Teenagers in Crisis.* One disturbing result is more than one million teenage pregnancies each year in the United States, more than one-half out of wedlock. According to *Preventing Teenage Pregnancy,* by Susan E. Foster (1986), preventive action could be the single most important measure a state could take to avoid future expenses. A long-term view of these issues is offered by *Marriage and the Family in the Year 2020,* edited by Lester A. Kirkendall and Arthur E. Gravett (1984).

Our era of multiple transformations will demand more and better learning, both in and out of schools and colleges. Several national reports, in recent years, have urged excellence in education. These reports and various other issues, pro and con, are brought together in *The Great School Debate,* edited by Beatrice and Ronald Gross (1985).

Last Chance for Our Children, by California School Superintendent Bill Honig (1985), applies much common sense in arguing for the need to upgrade our level of learning. *Teaching and Learning in a Microelectronic Age,* by Harold G. Shane (1987), offers a simply written and well-balanced introduction to education in a high-tech society. And the report of the Study Commission on Global Education, *The United States Prepares for Its Future: Global Perspectives in Education* (1987), emphasizes four curricular areas so that Americans can participate more effectively in the world of the future: better understanding of world systems, world civilizations, diverse cultural patterns, and how to analyze domestic and international issues.

Children are no longer the only Americans who must learn. The Commission on Higher Education and the Adult Learner, in its brief report on *Adult Learners: Key to the Nation's Future* (1984), argues that the ongoing pursuit of learning by adults through their years of competence is now a necessity for the public interest. Not only is there a need for renewing employability skills and upgrading the 25 to 45 million functionally illiterate American adults, but there is a need for knowledgeable citizens in our technological society.

Touring alternative views of probable, possible, and preferable futures may be one of the most important learning projects for any American to take. Think about it!

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Handout 2
Self-Assessment Instrument — Knowledge of Techniques for Futures Perspectives

RATING SCALE: Please use the following scale in rating your present knowledge for each item.

1	2	3	4
No Knowledge	Some Knowledge	Adequate Knowledge	Expert Knowledge

KNOWLEDGE OF FUTURES LITERATURE:

1. Am able to locate quickly abstracts, reports, and articles on trends, forecasts, and projections. . . . . __________
2. Know several useful books that describe futures research techniques. . . . . __________
3. Know several important books on the future of society and technology. . . . . __________
4. Know several important books on futures thinking about natural and human resources. . . . . __________
5. Am able to locate a variety of classical and contemporary works of fictional futures literature. . . . . __________
6. Am familiar with general, introductory futures literature in at least one problem area of the future (e.g., housing, world food supply, biotechnology, energy, communications, health care). . . . . __________

TECHNIQUES FOR FUTURES PERSPECTIVES: COOPERATIVE EXTENSION'S ROLE

7. Am able to explain why Cooperative Extension should apply techniques for futures perspectives to its own programs. . . . . __________
8. Am able to explain why Cooperative Extension should be capable of teaching techniques for futures perspectives to its publics. . . . . . __________
9. Understand why it is important for members of society, Cooperative Extension's publics, to be involved in futures study. . . . __________

DEFINITIONS AND PURPOSES FOR FUTURES PERSPECTIVES TECHNIQUES

10. Am able to define the term "techniques for futures perspectives." . . __________

11. Am able to distinguish and explain the differences among the four major types of techniques for futures perspectives. . . . . . . ________

TIME PERSPECTIVES AND RESISTANCE TO FUTURES STUDY

12. Recognize variables that affect one's perspective on time. . . . . . . ________

13. Recognize why some persons may resist or avoid thinking about the future. . . . . ________

14. Am able to explain a variety of incentives for engaging in futures study. . . . . ________

15. Am able to explain the qualities of a person who has developed a futurist perspective. . . . . ________

ANTICIPATORY LEARNING TECHNIQUES FOR FUTURES PERSPECTIVES

16. Understand the distinction between "learning by shock" and "anticipatory learning," and am able to explain the mental capacities required for anticipatory learning. . . . . ________

17. Am able to describe purposes and procedures for using future-oriented visual media in anticipatory learning activities. . . . . ________

18. Am able to describe purposes and procedures for using future-oriented fiction in anticipatory learning programs. . . . . ________

19. Am able to describe purposes and procedures for using future-oriented games and simulations in anticipatory learning activities. . . ________

PROJECTION AND FORECASTING TECHNIQUES FOR FUTURES PERSPECTIVES

20. Understand the assumptions upon which projection and forecasting techniques are based, and the limitations of these forecasting techniques. . . . . ________

21. Am able to describe a typical activity sequence for the use of forecasting techniques. . . . . ________

22. Am aware of sources for obtaining data and consultants for conducting forecasts, and where the major futures research centers are located. . . . . ________

23. Am able to describe purposes and procedures of Delphi analysis. . . ________

24. Am able to describe trend extrapolation advantages, steps, and key considerations in the use of trend extrapolation techniques. . . . ________

25. Am able to describe cross-impact analysis, its steps, and its advantages. . . . . ________

26. Know some limitations and potential usefulness of computer projection and forecasting. . . . . ________

PREVENTION AND ADAPTATION TECHNIQUES FOR FUTURES PERSPECTIVES

27. Am familiar with the history of impact or risk assessment. . . . . ________

28. Am able to describe the major content categories for technological, environmental, and social impact assessments. . . . . ________

29. Am able to describe the general purposes and procedures of impact assessments. . . . . ________

30. Understand dilemmas and typical conflicts that are inherent in impact and risk assessments. . . . . ________

INVENTION AND CREATION TECHNIQUES FOR FUTURES PERSPECTIVES

31. Am familiar with the generic approaches that reduce obstructive patterns of thinking, as well as those that increase brainstorming and reflection on preferences and values. . . . . ________

32. Am able to describe the general purposes and procedures of preference surveys. . . . . ________

33. Am able to describe the general purposes and procedures of value audits. . . . . ________

34. Am able to describe the general purposes and procedures of imaging the future. . . . . ________

35. Am able to describe the general purposes and procedures of scenario building. . . . . ________

36. Am able to describe the general purposes and procedures of futures history writing and action planning. . . . . ________

SELECTING TECHNIQUES FOR FUTURES PERSPECTIVES

37. Understand the major variables in choosing among the various techniques for futures perspectives. . . . . ________

38. Am able to describe a variety of situations in which techniques for futures perspectives have been used to further Cooperative Extension's own programming. . . . . ________

39. Am able to describe a variety of situations in which techniques for futures perspectives can be introduced to Cooperative Extension's publics. . . . . ________

Handout 3

In Search of Futurists — Futures Quotient (FQ) Self-Assessment Instrument

By **Michael Quinn Patton**

When you think about planning for the future, what's your time horizon? Next week's meeting schedule? Your annual work plan? A three-year, long-range plan? A five-year strategic plan? Next century (now only 14 years away)?

Do you think of yourself as having a futures orientation? Can you identify Extension colleagues you consider to be futurists? Is anyone you know really thinking in a visionary way about Extension's future? Or, are your colleagues finding it hard to think beyond the next legislative session?

This article is the beginning of a series on bringing a futures perspective to Extension. In future articles, we will explore how futurists approach the study of the future. We will examine the implications for Extension of some futurist predictions and visions. We will review some efforts already under way to prepare Extension for the twenty-first century. This article begins by examining the qualities and characteristics of a good futurist.

Suppose you want to bring together some people to form an ''Extension Futures Group.'' You are looking for people who are interested in and capable of peering into Extension's future in the next century. You want to assemble a group that can stretch the collective vision of Extension from the now to the then.

The first question is whether you would nominate yourself for this group. How high is your futures quotient? To help you reflect on the qualities of a good futurist, and to assess the extent to which you possess those qualities, I have designed a Futures Quotient (FQ) Self-Assessment Instrument.

The FQ instrument represents a quantitative summary of the characteristics I associate with futurism. It is not meant to be taken as a scientifically valid and reliable measure of futurism, but rather as a tool for stimulating reflection and discussion—and having some fun with the idea of a Futures Quotient (FQ). Let me suggest that you complete the self-assessment and compute your FQ *before* reading the discussion that follows on the 15 qualities represented in the instrument.

Futures Quotient (FQ) Self-Assessment Instrument

Each line is a continuum. Mark the space on the continuum that most closely fits your honest assessment of yourself. Mark only one space in each line.

1. Do you tend to be

Very optimistic.	___ F	___ U	___ T	___ U2	___ R	___ E	Very pessimistic.

2. How interested are you in statistics on trends?

I love statistics on trends.	___ F	___ U	___ T	___ U2	___ R	___ E	I hate statistics on trends.

3. How much control do you believe human beings have over the future?

Great control over the future.	___ F	___ U	___ T	___ U2	___ R	___ E	No real control over the future.

4. Which statement best describes you?

I love trying new things.	___ F	___ U	___ T	___ U2	___ R	___ E	I hate trying new things.

5. When the conversation turns to the future of the world,

I am easily bored.	___ F	___ U	___ T	___ U2	___ R	___ E	I am really stimulated.

6. I tend to examine things from

A global perspective: worldwide impacts	___ F	___ U	___ T	___ U2	___ R	___ E	A local perspective: my own backyard.

7. Ambiguities and uncertainties

Make me uncomfortable.	___ F	___ U	___ T	___ U2	___ R	___ E	Challenge me to think.

8. Situations I've never encountered are

Easy for me to imagine.	___ F	___ U	___ T	___ U2	___ R	___ E	Hard for me to imagine.

9. When it comes to predicting the future, I'm

Very confident about making a prediction.	___ F	___ U	___ T	___ U2	___ R	___ E	Very reluctant to make a prediction.

10. I get information from

A few very dependable sources.	___ F	___ U	___ T	___ U2	___ R	___ E	Lots of different sources.

11. I would describe myself as someone who

Welcomes risks.	___ F	___ U	___ T	___ U2	___ R	___ E	Avoids risks.

12. I prefer to focus on

Details.	___ F	___ U	___ T	___ U2	___ R	___ E	The big picture.

13. I prefer to work with

Definite end points: jobs that can be finished.	___ F	___ U	___ T	___ U2	___ R	___ E	Open-ended processes: jobs that have no end.

14. I think of myself as

Creative.	___ F	___ U	___ T	___ U2	___ R	___ E	Uncreative.

15. I think of myself as

A futuristic in orientation.	___ F	___ U	___ T	___ U2	___ R	___ E	Here-and-now in orientation.

—Patton, 1986

Calculating Your FQ

Circle the point score for each answer. Your total point score is your FQ.

	F	U	T	U2	R	E
1.	0	3	5	5	2	0
2.	5	4	3	2	1	0
3.	3	5	3	2	1	0
4.	5	4	3	2	1	0
5.	0	1	2	3	4	5
6.	5	4	3	2	1	0
7.	0	0	1	3	4	5
8.	5	4	3	2	1	0
9.	0	3	5	4	2	0
10.	1	2	3	3	4	5
11.	2	4	3	2	1	0
12.	1	2	3	4	5	5
13.	0	0	2	3	4	5
14.	5	4	3	2	1	0
15.	5	4	3	2	1	0

Total the scores.

My FQ is

Interpreting Your FQ Score

Your FQ is interpreted as follows:

61 or higher:
Potential futurist marathoner. Capable of going great distances in the mind. Board the thought–machine for the year 2000 and beyond!

51-60:
Potential long-distance enthusiast. You have excellent potential as a futurist, especially able to add solid doses of reality to discussions of the future.

41-50:
Recreational futurist runner. You are capable of taking a futures perspective, if you want to, but you will need some further work to develop and realize your potential for longer distances.

31-40:
Out of shape. You have some serious work to do, if you want to get into mind-shape for the future.

21-30:
Slow mover. You are doing well to keep up with the present. For you, thinking about the future means figuring out next week.

Under 21:
Couch potato. Your strong suit is hindsight. Your idea for long-range planning is predicting the past.

A Futurist Orientation

The first quality I would look for in a futurist is a balanced perspective—neither extremely optimistic nor extremely pessimistic (FQ item 1). Overoptimism reduces the ability to deal with real problems and dangers. Overpessimism smothers hope. My ideal futurist is *realistically hopeful.*

The next quality is an empirical perspective. Futures study is *study*—and is thus data-based. The visions generated and analyzed by futurists are grounded in the study of long-term trends and patterns (FQ item 2). Futurists look for information from a variety of sources in constructing these trends and patterns, distrustful of the limited perspective and fallibility of any single data source (FQ item 10).

My ideal futurist believes that human beings have an important and meaningful amount of control over the future. This belief is tempered by a clear recognition that there are forces, conditions, and events beyond human control. But, fundamentally, the futurist is interested in *creating the future*—not just studying it (FQ item 3).

Futurists are time explorers and, therefore, in love with the frontiers of new human experiences, new ideas, and newness itself. There is a passion to such exploration; thus the quite deliberate use of that sadly overused word ''love'' in FQ item 4.

Intellectual and emotional stimulation accompany exploration. Boredom falls victim to the futurist's sense of awe at the very notion of future (FQ item 5). One of the most important characteristics that separates homo sapiens from other animals is understanding even the possibility of future.

Futurists explore not only time, but also space. The globe, the universe—these are the territories of the futurist (FQ item 6). Diogenes was expressing his futurist understanding and vision when he said, in the fourth century, B.C., ''I am a citizen of the world.''

The futurist's openness to the world is an openness of mind. Thus, the futurist is at ease with and challenged by ambiguities, uncertainties—and the unknown, in general (FQ item 7). Futurists are also "imagineers," able to mind travel to and through the unknown, and unknowable, to imagine situations hitherto never encountered (FQ item 8).

Yet, it is this very sense of and respect for the unknown and unknowable that makes my ideal futurist modest about predicting the future. Overconfidence in one's ability to predict the future can lead to arrogance, orthodoxy, and inflexibility. However, a complete reluctance to make predictions is avoidance of the futurist's responsibility to play seer. Balance, then, is desirable, tending toward a belief in the possibility of prediction, but tempered with a healthy respect for the fallibility of human prognostication (FQ item 9).

FQ item 11 also emphasizes balance, this time with regard to risk taking. Time explorers necessarily take risks, but calculated risks. The overzealous risk taker can be a danger to the species, willing to gamble everything for one something. Any vision of the future must be conditioned by a clear sense of our potential for irreversible self-destruction.

In weighing the relative risks and benefits of various future scenarios, my ideal futurist is able to see the big picture. This means bringing a holistic perspective to futures analyses—a combination of technical, ethical, social, economic, and psychological considerations (FQ item 12).

With so many unknowns, so many possibilities, so many visions to be spun, and with the future an ever-expanding frontier, always beyond our grasp, the work of the futurist is an ongoing process, a truly never-ending story. Those who need concrete endpoints, definite parameters, and finished jobs need not apply (FQ item 13).

The final two dimensions of the FQ deal with self-definition. Are you creative? Are you a futurist? These are not genetic characteristics. People who say, "I'm not creative" have established a self-fulfilling prophecy of self-limitation; likewise, a futurist orientation. The first step in being a futurist is deciding to be one. Developing a futurist orientation begins when you decide you value and want to cultivate your already existent, but perhaps underdeveloped, futurist quotient.

Having decided to be a futurist, and to bring a futurist orientation to Extension, you can then cultivate and strengthen those qualities that undergird the futurist perspective. The qualities you identify may differ substantially from my summary list. The point is to develop a list, and to cultivate those qualities of mind and habit that will help transport you—and all of us—into a created future.

Summary: Futurist Qualities

1. Balanced perspective—not overly optimistic or overly pessimistic.

2. Empirical perspective—follows statistical trends and qualitative patterns.

3. Believes in the possibility of creating the future.

4. Innovative—likes to try new things, try on new ideas.

5. Intellectually and emotionally stimulated by consideration of futures.

6. Global, universal perspective.

7. Comfortable with and challenged by ambiguities, uncertainties, and the unknown.

8. Imaginative.

9. Modest about, but willing to make predictions.

10. Seeks information from multiple and diverse sources.

11. Calculated and careful risk taker.

12. Holistic, big-picture perspective.

13. Process-oriented, without need for definitive endpoints and precise answers.

14. Creative.

15. A Futurist—by self-definition.

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Handout 4
Glossary of Futures Study Terminology

Alternative futures. A tenet of futures research is that little is inevitable about the future, so it makes more sense to refer to "futures" as plural rather than to a single, set-in-concrete "future." The future is best described as a cluster of possibilities, known as alternative futures. The alternative that becomes the reality can be the result of choices and plans made now.

Anticipatory learning. A future-oriented learning process aimed at liberating persons from socially imposed notions and unexamined expectations regarding the future, and enhancing their capabilities to think with a future orientation.

Brainstorming. A process for freeing the mind from its ties to traditional patterns of thinking. Brainstorming encourages the free generation of novel ideas, limits negative analysis and criticism, and stimulates spontaneity and interactive group synergy.

Cross-impact analysis. A forecasting technique used to examine and estimate the results of interactions among future events and to uncover potential damages or opportunities that might be expected to occur if events happen in a particular sequence.

Delphi technique (or method). A forecasting procedure used to obtain a convergence of opinion from a panel of experts through a series of questionnaires. Questions are distributed to individual experts, and the responses are summarized. Between question rounds, the panel members are informed of the group's previous distribution of opinion. Rounds of questioning are repeated until agreement is reached. The technique also can be used to encourage divergent thinking and to estimate potential consequences of alternative policies or other interventions.

Discontinuity. An abrupt change in features or trends of human life through natural catastrophes, new technologies, or changes in the use of major resources. Discontinuities "break" trends and limit their accuracy in forecasting the future.

Environmental impact assessment. A process, defined by the National Environmental Protection Act, that is intended to protect the quality of environmental and social conditions through assessing the potential intended and unintended consequences of specific plans, categories of which are specified in legislation.

"Future shock." As described in Alvin Toffler's book of this title, "future shock" is the disorientation brought on by rapid social change.

Futures history writing. A learning process in which persons are motivated to write the history of what they want to see happen as if it had already happened, thus enabling them to discover what would have to occur for it to happen.

Global modeling. The creation of future forecasts or predictions by using computers to simulate trends in world conditions.

Images of the future. Visions of ideal conditions that could become realities in the foreseeable future. Images of the future elicit interest in working for an improved future.

Imaging potential: goals to action. A learning process that emphasizes the creation of achievable goals through projecting oneself into the future and describing, in detail, a specific vision of the way one then views the situation using the present tense. Goals are selected and analyzed, and strategies are created for their achievement.

Invention and creation techniques. Learning processes in which emphasis is placed on the capacity of individuals, groups, and organizations to invent and create preferred conditions and states, or impelling goals and images, as the basis for influencing the future, through choice.

"Learning by shock." The failure to anticipate consequences which result in persons being forced to learn unexpectedly in a reactive, rather than in a proactive, mode.

Participatory research and planning. The inclusion of nonprofessional researchers, planners, the public, and lay persons in planning efforts by having them contribute data; learn about the results of studies; provide feedback on alternative possibilities and choices; collaborate with experts in the creation of visions and images of the future; and, in some cases, undertake studies that they initiate, control, analyze, and act upon themselves.

Personal time perspectives. The relative differences in how individuals judge the importance, eventfulness, and length of time spans when they think of the past, present, or future. Individuals, age groups, organizations, communities, and societies can differ in the way they view the future and the importance they give to doing so.

Postindustrial society. The next stage in societal evolution, according to Daniel Bell. The primary activity will be the production of knowledge, and a majority of the labor force will work in the service sector of the economy.

Projection and forecasting techniques. A future-oriented learning process in which methods are used to project information into the future, based on historical regularities, patterns and cycles, or theories of causality to determine what is likely to happen.

Preference survey. A technique used to solicit peoples' opinions, desires, wishes, or values with regard to particular future situations or environments.

Prevention and adaptation techniques. Future-oriented learning processes that focus on specific proposed interventions; environmental, health, or social hazards; or alternative plans, policies, construction, and technology use, and then proceed with an assessment of risk of potentially undesirable, hazardous, or unintended consequences of each specific proposal or scenario. Plans for adaptations are formulated, if necessary.

Risk assessment. A research process, primarily associated with public health concerns, in which the focus is upon determining the extent of risk and acceptable standards associated with environmental or technological conditions that are or could be hazardous to persons.

Scenario building. A narrative sketch of a hypothetical sequence of future events. Herman Kahn, to whom this device is credited, emphasizes that a scenario is constructed for the purpose of focusing attention on casual processes and decision points.

Simulation gaming. A projective activity in which players imitate the components of real-world systems, and act out, in a game, various alternative futures and their consequences.

Simulation or computer modeling. A forecasting method in which attempts are made, usually with the aid of a computer, to replicate the behavior of a system and to trace its changes through time.

Social indicator. A data series used to measure social features of interest, such as educational trends, housing, or quality of life.

Social impact assessment. The examination of potential impacts of a proposed change on the well-being of individuals, organizations, groups, neighborhoods, or communities. The assessment usually accompanies an environmental or technological impact assessment.

Spaceship Earth. An image suggested by Buckminster Fuller to indicate the unity and fragility of the world as it moves through the universe.

Techniques for futures perspectives. Any systematic activity or process that is used to increase our motivation to think about the future; improve our understanding concerning implications of trends, consequences of present intended or unintended behaviors, decisions, and policies; or enhance our vision of a desirable future toward which our activities can be directed.

Technology impact assessment. The examination, often by means of quantitative methods, of the potential effects on social and physical environments into which the proposed technology will be introduced.

Technological (or technology) forecasting. The quantitative projection of advances in a particular technology, and their acceptance in the marketplace. Application examples include the production, sale, and adoption of computers, videodiscs, and solar energy technology.

Trend extrapolation. A forecasting method in which repeated measurements of data are made and then compared, across time, and projected into the future.

Handout 5
Personal Orientations to Futures Thinking

Think about your own way of viewing the future, as well as the orientations that you have encountered through conversations with your friends, travel, reading, and the mass media. Then jot down your informal, immediate responses to the following questions:

1. What are the various emotions and feelings of people when they think about their own futures?

2. What are the various emotions and feelings of people when they think about the future of their communities?

3. What are the various emotions and feelings of people when they view the future of our planet?

4. What determines the future? How would different ideologies or beliefs with which you are familiar answer this question?

Handout 6
Developing a Future Time Perspective—Variables of Interest to Educators

By **Thomas J. Sork (1980)**

On the surface, the concept "time" appears to be rather straightforward and unambiguous. It is, some would say, that which is measured with clocks—the measured period during which the experiences of life occur. Yet industrial man's fixation on objective time, as measured by using clocks and other devices for establishing and standardizing the periodicity of events, has resulted in a benign neglect of subjective time: time as experienced by people.

The purpose of this paper is to provide a foundation for exploring the implications that variations in the development of a personal time perspective—more specifically, a future time perspective—have for individuals involved in the enterprise of education. To accomplish this purpose, the following major topics are addressed sequentially (indicating an expected temporal order of presentation): (1) the nature of time perspective, (2) the results of selected theoretical and empirical studies of time perspective, and (3) implications of research findings to those involved in education.

The Nature of Time Perspective

In a recent essay on time and a sense of the future, McHale (1978, p. 2) stated that

> . . . individuals, cultures, and societies may be modally oriented toward the past, the present, or the future. This major orientation has a strong value component, which influences the direction of personal and collective actions. Apart from the value placed on time itself, on its duration, or on recording its periodicities, the prevailing temporal perspective will determine to a considerable degree how time is invested. Time, space, energy, and other resources may be allocated, with varying emphasis, to the service of past traditions, to present needs or to future prospectives.

But what are the origins of man's temporal perspective? What is it that causes individuals, cultures, and societies to develop a primary orientation to the past, present, or the future? Whitrow (1961, p. 52) believes that

> . . . the psychological origin of the concept of time is to be found in the conscious realization of the distinction between desire and satisfaction. The sense of purpose and associated effort is the ultimate source of the ideas of cause and effect; but it was only by a series of scientific abstractions that man eventually arrived at the concepts of a uniform, temporal sequence and a definite casual process.

Once the intellectual bridge was built joining action today with results tomorrow, it became necessary for humans to begin ordering their experiences into the three categories of things that have happened (past); things that are happening (present); and things that will happen (future). No longer was the idea of a predestined existence, in which random or uncontrollable forces orchestrated the life of the individual, the only possible conception of human reality. Realization that some control over life's events was possible may have had a tremendous liberating effect on primitive humans. They were now able to fabricate tools and weapons that could be put to use in acquiring food or defending territory. The cause/effect connection allowed them to become planners. And those who identified important cause/effect relationships (i.e., lunar movements and changes in tides, formation of certain cloud types and precipitation) were given high, almost mystical, status in their social groups because of their ability to make predictions.

But, time perspective is clearly a more complex concept than this sequence of developments may suggest. Contemporary analysts of the concept have identified a number of discrete dimensions that, together, provide a much more complete understanding of temporality.

A number of authors, including Kastenbaum (1960), Bortner and Hultsch (1972), Hulstch and Bortner (1974), O'Rand and Ellis (1975), Trommsdorff and Lamm (1975), and Lamm et al. (1976), refer to the concept of *extension.* This dimension accounts for the size of the time span (usually measured in years) within the consciousness of the individual.

Size of the time span is measured several ways. Frequently individuals are asked to identify a number of important events (past, present, or future) in their lives and to associate a date with each event. Degree of extensionality is then determined by measuring the time interval between the most distant past and future events. Alternatively, if the assessment concerns only the future perspective, extensionality is determined by identifying the most distant future event anticipated by the individual.

Another method that was used, first by LeShan (1952) and later by Barndt and Johnson (1955), to assess extensionality is to direct the individual to complete a story for which a standardized ''root'' is provided. The resulting stories are then analyzed and a scoring system is devised to represent the maximum extension of time projected by each subject. The point of maximum extension into the future is referred to as the *time horizon.*

A second dimension of time perspective identified in the literature is *density,* which accounts for the perceived eventfulness of time in the person's past, present, and future. Kastenbaum (1961) measured density by asking subjects to list as many events as they could that were likely to occur in their personal future. Lamm et al. (1976) measured density by asking subjects to list, within a prescribed time period, events whose occurrence a person hopes for or fears. An index is then developed that allows comparison of density across individuals.

A third dimension is *direction* or *directionality,* which is intended to assess the relative importance of the past, present, and future. Cottle (1976) refers to his dimension as temporal dominance. His measurement technique involves having subjects draw three circles representing the past, present, and future. The relative size of the circle is indicative of the direction of the subjects' temporal orientation. If the largest circle drawn represents the future, then theoretically the subject will exhibit a future directionality. Kastenbaum (1961) did an experimental analysis, using the Time Metaphors Test developed by Knapp and Garbutt (1958). This instrument provides subjects with a group of metaphors. Their task is to select the metaphor that most nearly represents what the concept of time means to them. The subjects' directionality is then determined, based on the selected metaphor.

Little agreement is found in the literature on what other dimensions of time perspective are important. The three enumerated appear to represent those on which a moderate amount of agreement has been achieved.

Research on Time Perspective

Singer (1974) provided a useful concept to which the findings of several other researchers can be related. This concept is the ''future-focused role-image'' (FFRI), defined as one's self-image projected into the future. Singer presents the FFRI as an important goal toward which educators should work. The FFRI is developed concurrently with a future-oriented time perspective. However, as the following findings demonstrate, not everyone is necessarily a candidate for a developed future-focused role-image.

Age and Time Perspective

Green (1975) proposed a series of developmental stages that individuals must go through on their way to temporal maturity. Her proposed stages and corresponding age ranges are as follows:

1. Permanence of objects and persons (during year 1). During this stage the infant comes to accept that people and objects have permanence; that they exist even though they are out of the immediate perceptual range of the child.

2. Clock time (1–3 years). Children must next adjust to arbitrary time as accounted for with clocks. During this stage the child's patterns of eating and sleeping are governed more by external clock time than by internal subjective time. The child can anticipate adult behavior because both adult and child are using cultural time.

3. Restriction time (3–5 years). Children of this age find there are times when interests can be safely expanded, and times when it is necessary to stop, obey, and accept a dependent status. Because of this dichotomy of time, the child must learn to tolerate larger and larger periods of frustration.

4. Causal sequences (6–11 years). At this stage of development, the child, through observation and exploration of the environment, identifies causal sequences that produce both positive and negative outcomes. The child begins to realize that doing things in a particular order produces desired results with the least expenditures of effort.

5. Personal time (12–15 years). Adolescents can see themselves in past time and project their potentialities in the future. They can think about their thoughts. Prior to this stage, the self has been an unconscious, cohesive force lacking an overt sense of the self in time. However, the time perspective, as well as the perception of self, is not projected very far into the future.

6. Mutual time (15–25 years). Quoting Green (1975, p. 7), "the problem here is the search for intimate compatibility with another person for no other purpose than the complete sharing in time of experience. It may be the mutuality in time of two lovers or of two intimate friends, or the rapport of a younger person with a significant adult. The sense of personal isolation is forever reversed."

7. Alternatives in time (18–25 years). As individuals enter adulthood they are forced to make choices that will determine the kind of future they will experience. This task calls for an analysis of one's past and an exploration of alternative futures. The future pursued is determined solely by the individual.

8. The uses of time (25–40 years). Green (1975, p. 9) describes this period as "the period of greatest convergence between external or objective time and subjective time. One comes to grips with reality, so to speak, by no longer upholding the dichotomy between personal time and clock time. Behavior is brought into line with the consensual validation of group time in order to get things done. Commitment to job, marriage, children, and property finally focuses the use of time toward establishing and securing these goals."

9. Reconsidered time (40–50 years). Evaluation of one's life-to-date takes place at this stage, and a decision is made as to whether or not changes in life plan should be made. The now-in-vogue "mid-life crisis," when the individual decides that a change in life plan is necessary, is a consequence of this analysis.

10. The foreshortened future (50–60 years). During this stage, realization of one's mortality, coupled with the rapid passage of subjective time, leads the individual to covet what time remains. Emphasis is on achieving unattained goals and conserving, through more efficient use of clock time, the time remaining in one's life. According to Green (1975, p. 12), "to disguise the signs of aging often becomes a preoccupation of both sexes, for it comforts the self to avoid recognizing the foreclosure of time."

11. The rich past (beginning at about age 65). The process of life review requires individuals to recount events of their past and to pass judgment on their actions. Subjective time passes quickly, and the focus of attention is on the past.

These problems of time, encountered by individuals as they develop, show that developing a personal time perspective, of which FFRI is a part, begins at birth and probably does not take full form until the ages of 12 to 15 years, when personal time develops. Further, this theoretical framework, rich in hypotheses, suggests that each stage of development involves a somewhat different orientation to time. Research on time perspective at each stage would seem to require discrete, conceptual frameworks and psychometrics.

Studies with adults suggest that directionality favors a future orientation from the twenties to the fifties. Hultsch and Bortner (1974, pp. 836-837) wrote that "through the early 50s, people think that they have made and will continue to make progress. By the early 60s, the past seems better than the present, and the present seems better than the future." Directionality, then, appears to favor a future orientation up to the fifties, at which time a shift begins, first, to equal directionality, and then to a dominance of the past.

Social Class and Time Perspective

LeShan (1952), in one of the pioneering studies relating time orientation to social class, found that time orientations between lower-class and middle-class 8–11-year-olds were significantly different. Children from the middle-class told stories that were more future-oriented than the children from lower-class backgrounds.

In a study designed to compare the temporal outlooks (primarily *extension*) of lower-class and middle-class youth of college age, O'Rand and Ellis (1975) found that the middle-class youth had a significantly greater extension of time perspective into the future than did lower-class youth.

Lamm et al. (1976) reported on both density and extension. They hypothesized that lower-class adolescents would evidence more hopes and fears (*density*) concerned with private matters than with public matters. In addition, they hypothesized that middle-class adolescents have a more widely extended future orientation than do lower-class adolescents. Both hypotheses were confirmed by their research.

These studies suggest that there is indeed an important relationship between social class and time perspective. Consequently, if educators accept the task of assisting youth to develop an FFRI, then youth from lower socioeconomic groups will require more attention than youth from other groups.

Sex and Time Perspective

Little research has focused specifically on variations in time perspective by sex. Lamm et al. (1976) reported that males voice significantly more hopes and fears (density) than females in the occupational domains, while female adolescents of both lower and middle classes voice more hopes and fears in the private domain. Further, lower-class boys have a more extended future orientation than do lower-class girls. Bart (1974, p. 55) offers explanations for these findings.

> From the moment of birth, external and constraining forces, many arising from the education process, have shaped us, interacting with and molding our original biological sexual identity, to make us into first boys and girls and then men and women fitted to be citizens of the past. The future is part of the present. Yet education sex-types us for obsolete roles by imposing sharply different expectations on boys and girls, and has reinforced this sex-typing through stereotypes in the books students read.

Her challenge to educators seems formidable.

Cultural Differences and Time Perspective

Cross-cultural studies, limited in number as they are, seem to point to clear distinctions in time perspectives among various cultures. Nakamura (1966, p. 80) draws comparisons between Indian and Japanese notions of time. Indians have developed a static conception of time which makes it difficult to develop a future time perspective. More specifically,

> The persistent Indian conception of a transcendent reality as more important than the phenomenal world it underlies and sustains results in a kind of paralysis of the individual's sensitivity to time, if we understand "time" to mean the passage and flow of specific events in our experience. This paralysis manifests itself in a characteristic lack of time concepts which non-Indians regard as common sense.

Nakamura (1966, p. 85) continues:

> Japanese Buddhism also emphasizes the transience of the phenomenal world. But the Japanese attitude toward this transience is very different from the Indian. The Japanese disposition is to lay a greater emphasis upon sensible, concrete events, intuitively apprehended, than upon universals. It is in direct contrast to the characteristic Indian reaction to the world of change, which is to reject it in favor of an ultimate reality, a transcendent absolute in which the mind can find refuge from the ceaseless flux of observed phenomena.

Shannon conducted research with Anglo-American, American Indian, and Mexican American youth from 10 to 17 years of age. Expected significant differences were found in the time perspectives (extensionality) between the Anglo-American and other groups. Shannon (1975, p. 114) explains the differences:

> The increase in future orientation for Anglo-Americans is consistent with previous findings for this group and reflects the absence of conflict between a cultural focus on future achievements and the expectations of future reward. A quite different picture emerges for Indian and Mexican Americans. By adolescence, their growing awareness that members of disadvantaged subcultures are not likely to realize substantial reward in the future is in conflict with the more affluent majority-culture norms of future orientation. In spite of considerable exposure to middle-class attitudes toward time, they maintain their present orientation.

Poussaint (1974, p. 45) makes a similar case for the black American child:

> In large part, a child's image of the future is a reflection on his socioeconomic background, i.e., does he belong to the in-group as opposed to the out-group in the current status hierarchy; is he poor; is he rich; and to what ethnic group does he belong? Clearly, the future of a slum child will differ vastly from that of his peer in suburbia. In the United States, it is undoubtedly the color-caste system that is the most decisive element in the black child's perspective on his future life-changes and his self-image.

Givens studied Navajo temporality, and determined that their temporal orientation (ordering of past, present, and future based on cultural preferences) was essentially to the *present.* Further (Givens, 1977, p. 45), "the majority of the Navajo today value the present over the past and are only beginning to develop a Westernized concept of the future."

It seems clear from the foregoing that cultural differences do account for variations in future perspective. But the type of response educators should make to this realization remains unclear.

Questions for Further Inquiry

The foregoing research findings provoke a number of important questions that beg the attention of educational futurists. Indeed, without satisfactory answers to those questions, the basic assumptions upon which the educational futures movement has developed may be open to serious conceptual and theoretical challenge.

1. How much responsibility should educators assume for assisting learners in developing a futures perspective? Much research evidence suggests that a futures perspective is affected by multiple psychological and sociological variables. In some social groups and cultures, the dominant time orientation is to the past or present rather than to the future. The educational enterprise has accepted responsibility for providing basic education, discipline, child care, socialization, sex education, and nutritious meals, along with other responsibilities. Is it also education's responsibility to develop a future-oriented populace? If educators do not accept this responsibility, who will? What are the potential consequences of continuing to have a small segment of the population (primarily white, upper middle-class males) dominating the associations, conferences, and publications dealing with the future?

2. Under what circumstances should educators avoid helping learners develop a futures perspective? It seems there are compelling ethical questions that must be faced by educational futurists. Research suggests that there are sociocultural differences in time orientation. Should educators be attempting to develop future-oriented time perspectives in individuals who will live in a past-oriented or a present-oriented social system? What are the social-psychological consequences for a future-oriented person living in a past-oriented or a present-oriented milieu? If the rewards for developing a futures perspective are culturally biased, then what right or responsibility do educators have to foster delayed-gratification, goal-oriented behavior of those who are least likely to reap the benefits of such behavior? There appear to be some negative consequences associated with a futures perspective. How can educators eliminate these consequences or know when they are destined to occur and thereby avoid them?

3. What factors are most responsible for retarding the development of a futures perspective, and how can they be overcome? Through research, the determinants of a futures perspective are beginning to be identified. As research progresses, a predictive model should emerge that identifies and explains variables that affect a futures perspective. Clearly, some variables will have much more power in the formula than others. Educators must face the prospect that some variables may effectively block the development of a futures perspective, while others, although providing a formidable barrier, can be overcome by using educational or other means. Deciding when the barrier can be overcome with education and when it cannot be is an essential question during the period of scarce resources ahead in the 1980s.

4. What techniques seem to be most effective in promoting the development of a futures perspective? Researchers are beginning to report results produced by various curricula and instructional devices. As with most educational outcomes, there is likely a wide variety of techniques that are effective in promoting a futures perspective. But as available resources continue to constrict the range of alternative approaches that can be used, those techniques found to be *most* effective will gain wide acceptance. Until the *best* techniques emerge, educators must devise strategies based on experience and sensation from the viscera. Documenting outcomes produced by such strategies is an important responsibility for all educators. For without such data, it will be quite difficult to determine which, if any, of the extant techniques are producing the desired results at least cost.

5.**How can the degree of development of a futures perspective be best assessed?** Futurists extol the virtues of an orientation to the future. Yet, the available literature clearly shows that considerable conceptual housecleaning is in order before an agreement is reached on what it means to have a futures time perspective. Clearly, there are multiple dimensions to the concept of time orientation, and most researchers choose to develop their own means of measuring it. Such psychometric diversity is important in any research involving a relatively new concept. But, before research results can be compared and a body of useful knowledge formulated, some comparability of measurement must be attained. As more and more researchers struggle with the problem of futures perspective, the concept will be focused and refined so that all eventually will use a similar vocabulary and means of measurement.

Closing Challenge

The reader is now charged with a responsibility. Educational futurism is in its infancy. If it is to reach its adolescence with some degree of grace and respectibility, a big job lies ahead. Difficult if not embarrassing questions must be asked of this emerging field of study. What evidence exists that its basic assumptions are correct? Is there a clearly developed conceptual and theoretical framework for this field? Are research activities designed to build on one another and thereby produce a validated body of useful knowledge? Is action based on something other than whim or fancy? Is educational futurism here to stay, or is it simply another "trendy innovation" that soon will be relegated to the junkheap of discarded social inventions? These and other questions must be addressed, if this field is to avoid the criticism that proponents of the field level at so many others: that it is simply an opportunistic special-interest group promoting simple solutions to complex problems, with neither a rational basis for action nor with clear consideration of consequences.

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Whitrow, G. J. 1961. *The Natural Philosophy of Time.* London: Thomas Nelson and Sons.

Handout 7
Could a Computer Replace Your County Agent?

Visualize, if you will, a quiet office in a rural setting with several computer terminals. Signs at the various terminals identify them as: "Extension Entomologist," "Extension Beef Cattle Nutritionist," "Extension Crops Specialist," and so forth. The sign near the front door of the building identifies it as the County Extension Service Office.

Inside, a technician hurries about checking paper in the trays of word processing printers, changing printer heads, and handling other mechanical duties. The only person around is a retirement-aged fellow sitting outside in the shade of a young tree.

"Yes, I was one of the county agents here, until we turned it over to the computers," the retiree notes. "Matter of fact, there were four of us agents and two secretaries when we had the office at the courthouse in town.

"But, that is all changed, now. That's progress. A farmer can get more price information from one of those terminals than any four of us could have given him on our best days."

This scene is a figment of a writer's imagination, but there are those who feel such a situation could develop in the not-so-distant future. For the time being, however, computers are thought of as more of a tool or assistant of the County Extension agent than as a potential replacement for him or her.

Tool of the Trade

"At the present time, we view computers and the communications technology they offer as an effective way of increasing the efficiency of county agents," says Iowa State University Associate Dean of Extension Vivian Jennings. "Computers are a tool, a good one, of the county agent's trade." For instance, last winter, the Iowa Extension Service used computers to help some 3,000 financially troubled farmers determine what they needed to do to stay in business.

"Using a portion of the Minnesota FIN-LRB program—that's a financial package—we were able to analyze the situation for a farmer in 12 to 15 minutes," Dr. Jennings says. "It would have taken us three to four hours to do the same thing by hand. We probably couldn't have served even 1,000 farmers if we hadn't had computers."

Computers probably will become an even more important part of the county agent's service in the years ahead, a Nebraska farmer says. He was quoted in the University of Nebraska *Farm, Ranch, and Home Quarterly* article, which details results of an attitude survey conducted by graduate student Charlotte Murphy.

The farmer said: "It used to be if we had an insect problem or a disease problem, we'd run down to the county agent. I think we have a lot more potential answers to those problems today. The county agent no longer can be an expert in entomology or an expert in animal nutrition; he [or she] is a people person.

"He [or she] can work with young people or old people on general problems. But specific answers are more valuable coming from someone who is an expert in that field. The answers can be more quickly and accurately attained directly from the university system through the computer or through educational television transmission."

This person was described as being among the "seasoned farmers" who have adopted and are making good use of modern agricultural communications technology. Another group, identified as "traditional farmers," was depicted as being aware of but unwilling to adopt such technology. The article quoted one traditional farmer.

Eye Contact Helps

"There is a lot to be said for just going in, eyeball-to-eyeball, and discussing a problem. It's kind of like serving on a committee. You're surprised by how many ideas you come up with that you wouldn't think of sitting by yourself."

Another traditional farmer put it this way: "I just can't picture pushing a button and getting that much good out of it . . . or walking away with as much confidence and information as you get from just talking to the man."

Kenneth R. Bolen, Assistant Director of Extension at the University of Nebraska, feels there will always be a place for county agents in the dissemination of technical information:

> I believe in high touch as well as high tech. We're going to need good minds in people to interpret data and to provide additional analyses of information transmitted by computers.

— From *Farm Computer News*,
September-October, 1985

Handout 8
A Word From the Global Computer Modelers

At the end of the proceedings of the Sixth Symposium of the International Institute for Applied Systems Analysis, Laxenburg, Austria 1982, this final word about the globe was recorded (Meadows et al., 1982, pp. 289-291):

> The most basic message of the global models is not new
> and should not be surprising.
>
> We do not need a computer model to tell us that:
>
> we must not destroy the system upon which our sustenance depends.
> poverty is wrong and preventable.
> the exploitation of one person or nation by another degrades
> both the exploited and the exploiter.
> it is better for individuals and nations to cooperate than to fight.
> the love we have for all humankind and for future generations
> should be the same as our love for those close to us.
>
> if we do not embrace these principles and live by them, our
> system cannot survive.
>
> our future is in our hands and will be no better or worse
> than we make it.
>
> These messages have been around for centuries.
> They reemerge periodically in different forms
> and now in the outputs of global models.
>
> Anything that persists for so long and comes from such diverse
> sources as gurus and input-output matrices must be coming
> very close to
> truth.
> We all know the truth
> at some level
> within ourselves.
> We have only to look honestly and deeply
> to find it.
>
> And yet we don't live as if we knew it.
>
> Some of us actively deny messages like the ones from the global models.
> Others try very hard not to think about them.
> Most of us
> feel helpless
> shrug our shoulders
> wish things were otherwise
> assume we can do nothing
> and go on living.

Meanwhile, on this planet,
twenty-eight people starve to death each minute
one species of life disappears forever every day
and one million dollars are spent each minute on armaments.

The current condition of our globe is intolerable
and we made it so.

It is changing
because of what we decide.

It could be beautiful.
If we would only
decide to get along together
be open to each other and to new ways of thinking
remember what is really important to us
and what is less so
and live our lives for that which is important.

As sophisticated, skeptical, scientific Westerners
We always react to statements like that by saying

It sounds too simple
And is in fact impossible.
How could we ever decide to get along together?
You don't just decide things like that.
And how could we get everyone else to decide it?

When everyone is so sophisticated
that they can't believe it could be simple to be honest
and to care

And everyone is so smart
that they know they don't count
so they never try

You get the kind of world we've got.

Maybe it's worth thinking another way
as if we cared and we made a difference,

Even if it is just groping in the dark.

Handout 9
Worksheet on Types of Impacts

INSTRUCTIONS: Select one of the following familiar technologies (radio, television, telephone, automobile, airplane, computer) and identify a primary, secondary, or indirect impact for yourself, for your local community, and for global society. Use the spaces to record your ideas.

Myself:

Primary	Secondary	Indirect

Local Community:

Primary	Secondary	Indirect

Global Society:

Primary	Secondary	Indirect

Handout 10
Steps to Consider While Selecting Techniques for Futures Perspectives

This activity is to be undertaken with the use of example situations described in the Sourcebook for Module 7. These steps also can be used with any situation identified by you while considering which techniques for generating futures perspectives to use.

1. Consider, for each example situation, which of the four approaches or purposes (anticipatory learning, projection and forecasting, prevention and adaptation, and invention and creation) are most relevant.

2. Consider, for each example situation, whether combinations of the four approaches might be helpful; if so, in what sequence?

3. Consider, for each example situation, how each of the other aspects, in addition to purpose, is relevant to making a decision about the selection of a technique or a combination of techniques (problem characterization, nature and extent of available information, scope of the situation, urgency of the situation, time frame, level of participation).

4. Select technique(s) for the example situation that you are considering, noting your rationale for each choice.

5. Specify Cooperative Extension's role in each of the example situations.

6. Test your judgment by reporting your selections to other participants and getting their reactions.

Handout 11
Workshop Evaluation— Module 7: Techniques for Futures Perspectives

PLACE:______________________________

DATE:______________________________

I. MODULE ASSESSMENT

(A) How useful will this training be for you?

______Critical
______Highly
______Moderately
______Not much or not at all

(B) How interesting was this in-service training to you?

______Very
______Moderately
______Somewhat
______Not much or not at all

(C) How would you rate the exercises or activities you completed?

______Excellent
______Good
______Acceptable
______Poor
______None were used

(D) How would you rate the quality of the audiovisual aids?

______Excellent
______Good
______Acceptable
______Poor
______Don't Know

(E) Based on a scale of "A" to "F," what grade would you give this workshop?

______is the grade I would give

II. OTHER COMMENTS

(A) What do you judge to be best about this workshop?

____
____
____
____
____
____
____
____

(B) What suggestions would you make to improve the workshop?

____
____
____
____
____
____
____
____

Working With Our Publics

Module 7: Techniques for Futures Perspectives

Instructional Aids

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Instructional Aids for Module 7

The following instructional aids, developed to accompany Module 7, are provided to assist workshop leaders in conducting effective learning experiences. These materials are referred to in the Leader's Guide and elsewhere in this Module. They are listed here by the unit in which they are used. Leaders may find this checklist helpful in ensuring that all necessary materials are on hand before presenting this Module.

The instructional aids include masters from which transparencies can be made using whatever type of equipment is available locally. Tips on producing transparencies are given at the end of this section.

Unit I. Introduction and Overview

Transparency 1: Working With Our Publics: In-Service Education for Cooperative Extension
Transparency 2: Why the Public Should Generate Futures Perspectives
Transparency 3: Purposes of **Module 7: Techniques for Futures Perspectives**
Transparency 4: Objectives for **Module 7: Techniques for Futures Perspectives**
Transparency 5: Definition of Techniques for Futures Perspectives
Transparency 6: Approaches to Generate Futures Perspectives
Transparency 7: Techniques for Futures Perspectives: Cooperative Extension's Opportunities and Role
Transparency 8: Who Can Make Use of Techniques for Futures Perspectives in Extension's Own Organization?
Transparency 9: Who Can Make Use of Techniques for Futures Perspectives in Extension's Publics?

Videotape: "Tomorrow Starts Today"

Posters: Futures

Unit II. Anticipatory Learning

TIP Sheet 1: Visual Reflection: Futures-Oriented Media
TIP Sheet 2: Reading and Dialogue: Fictional Futures Literature
TIP Sheet 3: Futures-Oriented Games and Simulations
Transparency 10: Purposes of Anticipatory Learning
Transparency 11: Capabilities Required for Anticipatory Learning
Transparency 12: Ways We Avoid Thinking About the Future
Transparency 13: Results of Futures Thinking Avoidance
Transparency 14: Incentives for Futures Study
Transparency 15: Developmental Stage Time Perspectives
Transparency 16: Qualities of Futurist-Oriented People
Transparency 17: Techniques for Anticipatory Learning
Transparency 18: Questions on "Touring Futures II: A Literature Guide to Futures Studies for Cooperative Extension"
Transparency 19: Procedures for Visual Reflection: Futures-Oriented Media
Transparency 20: Procedures for Reading and Dialogue: Fictional Futures Literature
Transparency 21: Procedures for Futures-Oriented Games and Simulations

Unit III. Projection and Forecasting

TIP Sheet 4: Delphi Analysis
TIP Sheet 5: Trend Extrapolation
TIP Sheet 6: Cross-Impact Analysis
Transparency 22: Limitations of Forecasting Techniques
Transparency 23: Activity Sequence for the Use of Forecasting
Transparency 24: Major Techniques for Projection and Forecasting
Transparency 25: Purposes of Delphi Analysis
Transparency 26: Procedures for Delphi Analysis
Transparency 27: Advantages of Trend Extrapolation
Transparency 28: Steps Involved in Trend Extrapolation
Transparency 29: Advantages of Cross-Impact Analysis
Transparency 30: Procedures for Cross-Impact Analysis

Unit IV. Prevention and Adaptation

Transparency 31: Categories of Impact Assessment
Transparency 32: Definition of Risk
Transparency 33: Definition of Impact
Transparency 34: Examples of Economic Impact Categories
Transparency 35: Examples of Technology Impact Categories
Transparency 36: Examples of Environmental Impact Assessment Categories
Transparency 37: Examples of Social Impact Assessment Categories
Transparency 38: Comparison Studies for Impact Assessments
Transparency 39: Purposes of Impact Assessments
Transparency 40: Procedures for Impact Assessments
Transparency 41: Decision Dilemmas of Impact Assessments
Transparency 42: Public Participation Activities for Impact Assessments
Transparency 43: Roles for Cooperative Extension Professionals

Unit V. Invention and Creation

TIP Sheet 7: Preference Surveys
TIP Sheet 8: Values Audits
TIP Sheet 9: Images and Imaging
TIP Sheet 10: Scenario Building
TIP Sheet 11: Futures History Writing
TIP Sheet 12: Action Planning
Transparency 44: Definition of Invention and Creation Techniques
Transparency 45: Techniques for Futures Invention and Creation
Transparency 46: Procedures for Conducting Preference Surveys
Transparency 47: Procedures for an Organization Values Audit
Transparency 48: Procedures for Imaging
Transparency 49: The Grammar of Imaging
Transparency 50: Definition of Scenario
Transparency 51: Procedures for Scenario Building
Transparency 52: Procedures for Futures History Writing
Transparency 53: Procedures for Action Planning

Unit VI. Selecting Techniques for Futures Perspectives

Transparency 54: Relationships Among Approaches for Futures Perspectives
Transparency 55: What to Consider When Selecting Techniques

Making Overhead Transparencies From the Transparency Masters

Provided with this module are masters for making transparencies to be used with an overhead projector. The transparencies can be made in one of three ways.

Method 1: Thermal Process

One of the quickest ways to make overhead transparencies is with a Thermofax copier or similar thermal machine designed for this purpose. The masters themselves, however, cannot be run through the Thermofax. Start by making good quality copies of the masters on an office copier. Then lay a piece of thermal transparency film on top of the copy and run the two sheets through the Thermofax machine together. (*Do not use acetate;* it will melt and destroy your copier.) The resulting positive transparency can be placed in a cardboard frame for durability. By using different types of film, transparencies of various colors can be made.

Method 2: Diazo Process

As in making transparencies by the Thermofax method, the first step in the diazo process is to make a high-quality copy of the transparency master. For this process, however, the copy must be translucent or transparent. The copy is placed onto a piece of diazo film and exposed in a special light box with an ultraviolet light source. After the proper exposure interval, the film is removed and processed in a jar of ammonia vapor. The completed film can be mounted in a cardboard frame. The color can be varied by using different types of diazo film.

Method 3: Film Negative Process

This process requires the use of a darkroom and a copy camera capable of handling large originals and negatives. No preliminary copying of the transparency masters is necessary. The masters themselves are photographed on 8 1/2-by-11-inch high-contrast line film at full size using the copy camera. After the film negative has been processed, the image will appear as clear areas on a black background. The negative can be mounted in a cardboard frame and used to project a white image on a black background or backed with an adhesive gel such as Project-O-Film to produce a colored image. This approach is ideal for situations in which the image is to be revealed one part at a time during projection; opaque flaps can be taped to the frame to cover the various parts of the image and turned back one at a time.

TIP Sheet 1
Visual Reflection: Futures-Oriented Media

Films and videotapes are excellent materials for stimulating futures discussion. Will the world of the future really look like these futures-oriented media? How could it become that way? Is the future depicted in media what we want it to be? In this TIP sheet we identify several sources for visual media products as well as a number of films and videotape programs that are useful in developing a futures perspective.

Procedures

The following procedures can be used with almost any type of visual medium as a means for providing futures-oriented reflection and discussion.

- Prior to viewing the visual media, provide participants with questions similar to the following:

(1) What positive or negative feelings about the future does this film or videotape call forth?

(2) Which alternative vision of the future do you agree with?

(3) To what extent does the content present an accurate projection or forecast?

(4) To what extent does the content alert you to potential consequences you wish to avoid?

(5) What ethical or moral issues are suggested?

(6) What new creative images of the future are stimulated by viewing the film or videotape?

- Following the viewing, encourage participants to share their observations, judgments, concerns, and imaginative responses with their peers, using questions like the preceding.

- Provide opportunity for participants to identify decisions that they can make or influence.

Most video rental centers have extensive collections of science fiction films that are available on VHS or BETA formats. Check with these centers if video formats can be used since rentals for available videotapes are much cheaper than feature 16mm films.

Futures Film and Videotape Information Sources

Finding futures-oriented films and videotapes for specific groups and situations can be time consuming and difficult. The following information sources can be very helpful:

Budget Films. 4590 Santa Monica Blvd., Los Angeles, Calif. 90029.

Consortium of University Film Centers. (Film libraries at 100 participating universities throughout the U.S. provide unified lending policy information for all films listed under the Consortium label).

Educational Film Locator of the Consortium of University Film Centers. 2nd ed. (1980). R.R. Bowker Co., New York and London.

Feature Films Directory. 8th ed. (1985). R.R. Bowker Co., New York and London.

Films Incorporated, 5547 N. Ravenswood Ave., Chicago, Ill. 60640 or 440 Park Avenue South, New York, N.Y. 10016.

McGraw-Hill Training Systems. P.O. Box 641, Del Mar, Calif. 92014.

Media Collections and Services. (1976). R. R. Bowker Co., New York and London.

National Information Center for Educational Media (NICEM). P.O. Box 40130, Albuquerque, N.M. 87197.

SAI Productions, SAI Media. Sterin and Associates, Inc., 1629 Forest Drive, Suite 302, Annapolis, Md. 21403.

Swank Motion Pictures, P.O. Box 231, St. Louis, Mo. 63166.

The Video Sourcebook. 7th ed. (1985). National Video Clearinghouse, Inc.

Warren, B. (1982). "Keep Watching the Skies!" *American Science Fiction Movies of the Fifties,* Vol. 1. Jefferson, N.C.: McFarland and Company.

Willis, D.C. (1982). *Horror and Science Fiction Films, II.* Metuchen, N.J.: The Scarecrow Press.

World Future Society, 4916 S. Elmo Avenue, Bethesda, Md. 20814.

Examples of Futures Films and Videotapes

Capricorn One. 127 min color (1978). Rental: Swank Motion Pictures, Box 231, St. Louis, Mo. 63166.

The China Reaction. 87 min color video (1980). Rental: Embassy Home Entertainment, 1901 Ave. of the Stars, Los Angeles, Calif. 90067.

The China Syndrome. 122 min color (1975). Rental: Arcus Films, Inc., 1225 Broadway, N.Y. 10001. Budget Films, 4900 Santa Monica Blvd., Los Angeles, Calif. 90029. Contact your local video center.

Cities of the Future. 25 min color (1967). Rental: Consortium of University Film Centers. 2nd ed. (1980). R.R. Bowker Company, New York and London.

Clockwork Orange. 137 min color (1971). Rental: Swank Motion Pictures, P.O. Box 231, St. Louis, Mo. 63166.

Embryo. 103 min color (1976). Rental: Swank Motion Pictures, P.O. Box 231, St. Louis, Mo. 63166.

The Food Revolution. 20 min color (1975). Columbia Broadcasting System, 383 Madison Ave., N.Y. 10017. Consortium of University Films Centers. McGraw-Hill Training Systems, P.O. Box 641, Del Mar, Calif. 92014.

The Four-Day Week. 25 min color (1967). National Broadcasting Co., 30 Rockefeller Plaza, N.Y. 10020. Consortium of University Films.

Futureprobe I: The 21st Century Home;Futureprobe II: Business in the Telematic Age; Futureprobe III: Tomorrow's Money. 60 min color videos (1986). Rental: SAI Productions, 1623 Forest Drive, Suite 302, Annapolis, Md. 21403.

Future Shock. 42 min color (1972). Rental: Available at all film libraries listed here.

Goodbye Gutenberg. 90 min color (1982). Rental: Films, Inc., 5547 N. Ravenswood Ave., Chicago, Ill. 60640.

Ground Zero. 50 min color video. Rental: University of Michigan, Media Resources Center, 400 Fourth Street, Ann Arbor, Mich. 48109.

The Human Influence. 20 min color (1985). Films for the Humanities, P.O. Box 2053, Princeton, N.J. 08543.

Man Made Man. 26 min color (1967). Columbia Broadcasting System, 383 Madison Ave., N.Y. 10017. Consortium of University Film Centers.

Metropolis. 30 min black and white (1963). Encyclopedia Britannica Education Corp., 425 N. Michigan Ave., Chicago, Ill. 60611. Consortium of University Film Centers. Films, Inc. 5547 N. Ravenswood Ave., Chicago, Ill. 60640.

The Metropolis (parts 1 and 2). Based on the book, *The Age of Uncertainty.* J.K. Galbraith. Dist: Films, Inc., 733 Green Bay Rd., Wilmette, Ill. 60091.

Miracle of the Mind (rev. ed.). 25 min color (1968). Columbia Broadcasting System, 383 Madison Ave., N.Y. 10017. Consortium of University Film Centers. McGraw-Hill Training Systems, P.O. Box 641, Del Mar, Calif., 92014.

continued

Modern Times. 90 min black and white (1936). Wayne State University, Center for Instructional Technology, 77 W. Canfield Ave., Detroit, Mich. 48202.

Network. 120 min color (1977). Dist: United Artists Entertainment, 729 Seventh Ave., N.Y. 10019.

One Hour to Zero. 56 min color (1980). Dist: Lucerne Films, Inc., 37 Ground Pine Road, Morris Plains, N.J. 07950.

Planet of the Apes. 122 min color (1968). Rental: Film or video, Films, Inc., 733 Wilmette Ave., Wilmette, Ill. 60091.

Sleeping Dogs. 107 min color. Sale: video, Vidamerica, 235 East 55th Street, N.Y. 10019.

Soylent Green. 97 min color (1973). Rental film or video: MGM, United, 1350 Ave. of the Americas, N.Y. 10019. Swank Motion Pictures, P.O. Box 231, St. Louis, Mo. 63166.

Stranger Than Science Fiction. 25 min color (1969). Columbia Broadcasting System, 383 Madison Ave., N.Y. 10017. Consortium of University Film Centers. McGraw-Hill Training Systems, P. O. Box 641, Del Mar, Calif. 92014.

The Third Wave. Color. Video production taken from A. Toffler's book by the same name. Producer: Public Broadcasting System, Boston, Mass.

Thunder in the City. 60 min black and white (1937). Rental: Budget Films, 4590 Santa Monica Blvd., Los Angeles, Calif. 90029; Mogulls Films, 1280 North Ave., Plainfield, N.J. 07062.

Tomorrow. 30 min black and white (1961). United Church of Christ, University of California, Berkeley.

The Ugly Little Boy. 26 min color (1977). The Learning Corporation of America, 108 Wilmot Road, Deerfield, Ill. 60015.

We. 29 min color (1973). Dist: U.S. National Audio Visual Center, General Services Administration, Washington, D.C. 20409.

The Weird World of Robots. 25 min color (1968). Columbia Broadcasting System, 383 Madison Ave., N.Y. 10017. Consortium of University Films. McGraw-Hill Training Systems, P.O. Box 641, Del Mar, Calif. 92014.

Filmstrips: *Newsweek's 2000 A.D.;* Doubleday's *Change Here for Tomorrow, Dimensions of Change, Economics and the Future, and The Population Debate*

TIP Sheet 2
Fictional Futures Literature: Reading and Dialogue

Most people know fictional futures literature as "science fiction." However, Marien (1979) calls it "fictional futures," because most of these novels include a good deal of social science. According to Marien, science fiction tends to be set in the far future and often involves adventures in outer space, while social science fiction tends to be relatively short-term and earth-based. Both types can be helpful to anticipatory learning.

Types of Fictional Futures Stories

Fictional futures can be categorized according to the premises upon which they are based. Livingston (1978) outlines four major types. Stories may be based on:

- A society of increased material wealth that is generated by technological progress. The stories offer a "surprise-free" vision of postindustrial societies. Often these stories offer a critical treatment of present society by criticizing the increasing popularity of "disposable possessions."
- An alternate economic and political arrangement to that which presently exists. Stories often challenge the prevailing notion of a nation-state system and prevailing social stereotypes.
- An exploration of what society would be like if social norms, values, or roles were reversed, changed, or challenged. In recent years, gender stereotypes have become targets of attention in futures fiction writings.
- Implications of radical changes in society due to increasing dependence on, or consequences of, technology.

Procedures

1. Obtain commitment from the group to read a story, in common, for a specific purpose.

2. Identify the dilemmas, values, or ethical issues that the group seeks to explore.

3. Select a common fictional futures work, using reference guides as a source.

4. Readers take notes on issues, images, values, and choices that the novel illustrates.

5. Readers discuss in the study circle the futures perspectives revealed in the novel.

6. Identify choices and decisions for individuals, groups, and organizations that grow out of the discussion.

Fictional Futures References Guides

Fictional futures is larger than any other type of futures literature. Fortunately there are several reference guides that are helpful in making selections and in locating stories that can become the basis for reflection and group discussion. The following reference guides are a starting point to classic fictional futures:

Asimov, Isaac (ed.). 1971. *Where Do We Go From Here?* Garden City, New York: Doubleday.

Barron, Neal (ed.). 1981. *Anatomy of Wonder*. 2nd ed. New York: R.R. Bowker Co.

Calkins, E., and B. McGhan. 1972. *Teaching Tomorrow: A Handbook of Science Fiction for Teachers.* Dayton, Ohio: Pflaum Publishers. (Provides a synopsis of over 200 science fiction works.)

Conklin, G. 1962. *Great Science Fiction by Scientists.* New York: Collier Books.

Ferman, Edward L. 1970. *Twenty Years of the Magazine of Fantasy and Science Fiction.* New York: G.P. Putnam's Sons.

Future Survey. Journal of the World Future Society, 4916 St. Elmo Ave., Bethesda, Maryland 20814.

Ginsburg, Mirra. 1970. *The Ultimate Threshold: A Collection of the Finest Soviet Science Fiction.* New York: Holt, Rinehart and Winston.

Hollister, B. 1974. *Another Tomorrow: A Science Fiction Anthology.* Dayton, Ohio: Pflaum Publishers.

Nicholls, Peter. 1979. *The Science Fiction Encyclopedia.* New York: Doubleday/Dolphin.

Possible Applications of Fictional Futures Literature

Fictional futures literature can be a prelude to specific future planning activities; a way of stretching the imagination of those who are involved. Study circles can be organized among people who already read fictional futures literature, thereby adding an educational reflection and discussion dimension to their reading. Fictional futures literature may well provide a bridge between the generations. 4-H youth may find that they can discuss with their elders, on an equal basis, their reactions to what they have read in common. Groups of 4-H youth can be encouraged to read and share science fiction together, or provide a community service by reading to older persons. Some 4-H programs have emphasized drama, and futures fiction stories can be used as a basis of drama productions or readings. Extension newsletters could provide an updated listing of fictional futures materials.

TIP Sheet 3
Futures-Oriented Games and Simulations

Games and simulations have become commonplace over the past several decades. However, gaming was a popular technique for war exercises as far back as the eighteenth century. These military games were used to analyze and create possible real war situations. Since World War II, military gaming has become increasingly sophisticated and has become an important policymaking consideration (Duke, 1978).

Gaming for social science or educational purposes, however, emerged only during the early 1960s. Initially, there was confusion about its application and usefulness in the social realm. Today, games or simulations are used to build theory, to conduct research, and to provide learning experiences (McLean, 1978). We are concerned here with games and simulations that can provide anticipatory learning for Extension's professionals and their publics.

Educational Use of Games and Simulation Exercises

Games and simulation exercises can be used as educational techniques to help people adopt a futures perspective and to assist in overcoming resistance to viewing the future. Purposes of games and simulations for viewing the future are to:

- Present alternative images of the future and help people to understand the decisions that can produce desirable realities;
- Motivate learners, and prepare them for possible future experiences;
- Assist learners in their discovery of the interrelationships among variables that influence the future;
- Enable learners to experience an activity that increases their awareness of possible futures;
- Stimulate learners' thought processes and logical reasoning regarding the future;
- Provide a sophisticated, interactive communication process about what could happen;
- Provide learners with an opportunity to create a multidimensional perspective of a given future situation;
- Enable learners to approach complex tasks from their own perspective in order to observe consequences in a fictional game situation;
- Offer learners an opportunity to experiment in a basically safe environment;
- Provide learners with a simulation bridge between their present experience and the potential of the future;

- Provide feedback to learners regarding the consequences of their choices;
- Enlarge learners' perceptions, overviews, and holistic visions; and
- Demonstrate to learners alternative strategies for creating a desirable future.

For futures games and simulations to be explicitly educational, it is important for learners to know the educational purposes at the outset. After playing the game or simulation, the leader should elicit from the participants the implications that the experience has for their present decisions.

Procedures

- Set educational goals for the use of games and simulations.
- Select games that relate to the goals; use the information sources provided in this TIP sheet.
- Explain the educational objectives to participants so that they keep them in mind during the entire activity.
- Facilitate the game or simulation; interpret the rules and operations, if necessary.
- Encourage dialogue on the choices and issues that the game brings out.
- Identify the choices for individuals, groups, and organizations that participants consider important as a result of playing the game.

Sources of Information on Games and Simulations

Barney, Gerald O., and Sheryl Wilkins. 1986. *Managing a Nation: The Software Source Book.* Arlington, Va.: Global Studies Center.

Horn, Robert E. (ed.). 1977. *The Guide to Simulation Games for Education.* 3rd ed. Cranford, N.J.: Didactic Systems.

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Examples of Future-Oriented Games and Simulations

The following list is a beginning for appreciating the programming possibilities of games or simulations. All are board games.

Balance. Interact, P.O. Box 997, Lakeside, Calif. 92040. Participants are members of four families, each living in a city with serious ecological problems. Each family completes a Family Decision Form to balance short-range hedonistic goals with long-range environmental goals.

continued

Cope. Interact, P.O. Box 997, Lakeside, Calif. 92040. Participants become residents of Technopolis, a city of the future, and live through future time periods from 2000–2040 A.D.

Dialogues on What Could Be. The Future Associates, P.O. Box 912, Shawnee Mission, Kansas 66201.

Ecopolis. Interact, P.O. Box 997, Lakeside, Calif. 92040. Participants are residents of Ecopolis, and must work together to solve ecological problems confronting the city.

Explosion. Interact, P.O. Box 997, Lakeside, Calif. 92040. Participants are residents of an overpopulated world, and must work together to solve shortages of resources and food.

Futura City. Newsweek Education Department, 444 Madison Ave., N.Y. 10022.

Future Decisions: The I.Q. Game. SAGA Publications, 4833 Greentree Rd., Lebanon, Ohio 45036.

Futures Planning Maps. Greenhaven Press, Box 831, Anoka, Maine 55303.

The Game of Future Shock. James Adams. 8443 Brett Lane, Columbia, Md. 21045.

Global Futures Game. Earthrise, P.O. Box 120, Annex Station, Providence, R.I. 02901.

Ground Zero. Interact, P.O. Box 997, Lakeside, Calif. 92040. Explores the consequences of nuclear war in your community. Participants role-play political positions that local community leaders may take concerning civil defense, nuclear armament, and U.S. nuclear war policy.

The Hopes and Fears Switchboard. DCM Associates, 908 Fox Plaza, San Francisco, Calif. 94102.

The Hybrid-Delphi Game. Jerome Saroff, Chairman, Urban and Regional Studies, University of Wisconsin–Oshkosh, Oshkosh, Wis. 54901.

The Life-Styles Games. The World Futures Society Bookstore, 4916 St. Elmo Ave., Bethesda, Md. 20814.

Simulation: Public Education in Natural Resource Management. National Resources Education Project, 127 Gaines Hall, Montana State University, Bozeman 59717.

Space Future and Other Cooperative Games. Family Pastimes, R.R. 4, Perth, Ontario, Canada K7A 3C6.

Survival. Interact, P.O. Box 997, Lakeside, Calif. 92040. This simulation examines the best resources for human survival. The focus is on four major energy sources, special-interest groups, environmentalists, and consumers. The participants set up a legislative hearing to devise the best possible energy laws.

Utopia. Interact, P.O. Box 997, Lakeside, Calif. 92040. Participants in this simulation construct an ideal society and vote on the principles that guide their new society.

continued

The Utopia Game. Ken Davis, Department of English, University of Kentucky, Lexington, Ky. 40506. Provides the framework for an extended workshop or course in which participants invent alternative futures. They read problem-area literature and utopian fiction; draw input cards; create scenarios; and organize a political campaign related to utopia-thinking.

The World Game. University City Science Center, 3508 Market Street, 214, Philadelphia, Penn. 19104.

Microcomputer Future-Oriented Games

The following examples are evidence that microcomputer software for future-oriented games is increasing. Some of these games help teach a regional, national, and occasionally a global perspective on the economy, energy, and the environment.

Energy and Environment. Compress, P.O. Box 102, Wentworth, N.H. 03282. Teaches basic information about national and global aspects of energy growth and the associated environmental implications. Operates on Apple II or Apple II Plus.

International Futures Simulation (IFS). Conduit, University of Iowa, Oakdale Campus, Iowa City 52242. Teaches global development in population, economics, agriculture, and energy through the year 2030. Operates on IBM PC/XT/PC jr; DOS 2.10, 192K, one-disk drive, color graphics card.

Market. Essex County Educational Services Division, 715 Park Ave., East Orange, N.J. 07017. Simulates two or more companies competing for the market for a particular product (bicycles). Operates on Apple II or II Plus.

Monarch. Dynacomp, 1427 Monroe Ave., Rochester, N.Y. 14618. Simulates the budgetary and resource decisions that the government of a small country must make to keep the citizens happy. Operates on Atari and Atari Basic.

Pollute. Essex County Educational Services Division, 715 Park Ave., East Orange, N.J. 07017. Examines the impact of various scientific and economic decisions on water pollution. Operates on Apple II or II Plus.

Simulation: Public Education in Natural Resource Management. Natural Resources Education Project, 127 Gaines Hall, Montana State University, Bozeman 59717. Simulates natural resource decisions on grazing lands, energy-environment, water resources, and home energy. Operates on electrical power grid units from small single-suitcase portable units or large exhibit units.

Streets of the City. Creative Computing, 39 E. Hanover Ave., Morris Plains, N.J. Simulates the political, administrative, and technical challenges involved in completing a 10-year plan of street and transit improvements, while retaining the support of a majority of the City Commission. Modeled on Grand Rapids, Michigan. Operates on Apple II Plus, Applesoft, or Atari.

Three-Mile Island. Muse Software, Inc., Charles St., Baltimore, Md. 21201. Shows the functions of the major components of a nuclear power reactor and some of the factors involved in operating a reactor. Operates on Apple II or Apple II Plus.

TIP Sheet 4
Delphi Analysis

Originally, the Delphi procedure was designed to solicit expert opinion on a particular subject through a very structured communication process. In this process a monitoring team was identified. This team was responsible for defining the problem, setting goals and objectives, and constructing a questionnaire to stimulate the subsequent Delphi process. Through a series of "rounds," the experts were asked to expound upon a particular matter; respond to other experts' replies; and redefine their own positions. Ultimately, their opinions were to converge or fall into agreement. Anonymity was maintained throughout the process.

Today, there are a number of versions of this technique that can be used by both laymen and experts. The purposes have multiplied. The Delphi process can be used to gather expert opinion for long-range forecasting. It also can be used to obtain expert opinion regarding the probability that certain events will or will not occur, and the nature of relationships among events. In addition, it can be used to create scenarios; forecast the effects of technology; or interpret trend extrapolation data. Both convergent and divergent responses can be obtained.

The Delphi process has some advantages over asking participants to deliberate together on a committee. For one thing, respondents do not need to be brought together in one place. By using the Delphi, a committee also can avoid (1) the domination of one expert over the others; (2) the hesitancy of individuals to take a position before all the facts are in or before they know which way the majority is headed; (3) the difficulty of publicly contradicting individuals in higher positions; (4) unwillingness to abandon a position once it is publicly taken; and (5) the fear of bringing up an idea that might turn out to be unacceptable and might result in a loss of face.

The quality and accuracy of responses to a Delphi are obviously only as good as the expert quality of the participants who became involved in the process. The questionaires must be carefully constructed, and the rounds must be orchestrated with a clear purpose in mind (Linstone, 1978).

Procedures

Although the procedures for Delphi may vary somewhat, the following steps are quite common (Linstone, 1978). These steps can form a core for many variations.

1. Formation of a team to undertake and monitor a Delphi on a given subject.

2. Selection of one or more panels to participate in the exercise. Customarily, the panelists are experts in the area to be investigated. However, lay persons with a vested interest in the topic frequently are included.

3. Development of the first-round Delphi questionnaire.

4. Testing of the questionnaire for proper wording (e.g., ambiguities, vagueness).

5. Transmission of the first questionnaires to the panelists.

6. Analysis of the first-round responses.

7. Preparation of the second-round questionnaire (and possible testing).

8. Transmission of the second-round questionnaires to the panelists.

9. Analysis of second-round responses. (Repeat questionnaires and analyses as long as desired, or as necessary to achieve stability in the results).

10. Preparation of a report by the analysis team to present the conclusions of the exercise.

Whenever the judgments of experts may be helpful, Delphi analysis should be considered as a vehicle for systematically gathering, analyzing, and synthesizing expert judgments regarding what may happen; what is desirable; and what are alternative ways of creating a desirable future.

References

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TIP Sheet 5
Trend Extrapolation

Most forecasts or projections are made by using quantitative data in the form of repeated measurements that are compared across time and extended into the future. Trend extrapolation looks for a tendency for the values in a time series to increase or decrease with steady regularity. For example, we can plot the population of a county in the U.S. during each census year. The data will show, in most cases, a steady trend with each successive set of census figures. There are a number of methods, of varying sophistication, for trend forecasting. The steps of the simplest, most common approach, which involves the inspection of the trend data and then plotting a projection into the future, is described in Unit III. Trend extrapolation can provide useful forecasts to some of our basic questions (Hill, 1978).

Procedures

1. Establish the problem of concern and then identify specific indicators that can be reported numerically.

2. Acquire data, on each indicator, for several points in time.

3. Plot the data points for each time period on a graph.

4. Analyze the trend by projecting the line on the graph into a future time period, while taking into consideration the overall pattern of the line.

Considerations in the Use of Trend Extrapolation

In using trend extrapolation in forecasting, the time period is a crucial consideration. A relatively long-time series is needed to "capture a trend." However, the decision about how long a time period to incorporate is largely contingent upon the nature of the problem under study. A general rule is to acquire and plot data over as long a time period as is possible, within the limitations of comparable and reliable historical data.

When projecting the trend, look for three different potential patterns in the data. Recognizing the specific pattern will increase the accuracy of projections. The potential patterns are:

(a) *Seasonality:* the tendency for figures to show regular fluctuations, due to seasonal effects. For example, retail sales peak during the Christmas period, so figures from December would give an unreliable projection for January.

(b) *Cyclical factor:* "cycles" refer to the brief, successive periods of fluctuations, either peak or low, that occur in the overall trend line. For example, housing starts often show cycles of increase and decrease within an overall growth trend.

(c) *Irregular shocks:* refers to points on the historical time line that do not show a pattern. When interpreting these shocks, we should ask if these changes could be due to unique events that may not apply to our projection. For example, wars and economic recessions produce irregular shocks in birth-rate trends, and we should consider these shocks in projecting school building needs.

When to Use Trend Extrapolation

Some suggestions on the use of trend extrapolation follow:

1. Trend extrapolation should be used only if the required data are accessible. The nonavailability of data proves to be a major constraint in projecting the answers to many questions.

2. Trend extrapolation, because of its relative ease of application, probably should be considered as a ''baseline methodology'' for most forecasting problems. After a trend exercise has been conducted, Extension educators or their publics can judge whether further, more sophisticated analysis by experts is warranted.

3. Trend extrapolation should be used in combination with other techniques. When used alone, Delphi findings may be misleading due to limitations of data, the failure to acknowledge irregular shock, and the possibility that novel, unanticipated factors may be at work. We recommend using trend extrapolation in combination with Delphi, cross impact analysis, and creation or invention methods.

Microcomputer Programs for Trend Extrapolation

A number of microcomputer programs have been written for trend extrapolation. The following are examples.

Farm Weather Center. Climate Assessment Technology, Inc., 11550 Fuqua, Suite 525, Houston, Tex. 77034. Helps forecast corn, soybean, or spring wheat crop development to maturity, based on soil properties and daily weather. Operates on IBM PC/XT/AT or compatible; DOS 2.0 or higher.

Rapid. Futures Group, 1029 Vermont Ave. NW, Washington, D.C. 20005. Prepares and presents analysis of how population factors affect a country's chance of attaining its stated economic and social goals. Operates on IBM PC or Apple II, II Plus, IIc.

Tracker. Argos Software, 1485 West Shaw Ave., Fresno, Calif. 93711. Provides a convenient means of recording information on everything that is done to a piece or pieces of farmland, and provides a display of resultant trends as a basis for farm management decisions. Operates on IBM PC/XT/AT; floppy disk: 256K memory.

Twigs. North Central Forest Experiment Station, 1992 Folwell Ave., St. Paul, Minn. 55108. Projects the growth of individual trees or groups of trees; estimates saw timber and cordwood volumes; and provides a wide variety of cutting and thinning options to simulate forest management practices. Operates on IBM PC/XT/AT or compatible.

References

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Lerenbach, H., and J.P. Cleary. 1981. *The Beginning Forecaster.* Belmont, Calif.: Lifetime Learning Publishers.

Silk, L.S., and M.L. Curley. 1970. *A Primer on Business Forecasting.* New York: Random House.

TIP Sheet 6
Cross-Impact Analysis

Cross-impact analysis is a technique for examining and estimating the interaction among two or more future events. The intent of the analysis is to identify aspects or effects that will either aid or hinder the occurrence of the other events. Cross-impact analysis is used to estimate the strength of cause-and-effect relationships, by constructing a matrix of major events relevant to the problem being examined. Cross-impact analysis estimates the conditional probability of an event occurring, given that various other events have or have not occurred (Harrell, 1976; Stover and Gordon, 1978).

Cross-impact analysis is based on the premise that societal events do not occur in isolation but are, in some way, connected to or affected by other events and developments. The method usually is used in conjunction with the Delphi technique, because, in most cases, expert opinion is used to determine the probability of an event.

Procedures

The method of cross-impact analysis described here does not require mathematical calculations. Rather, it is a procedure for securing and then displaying probability estimates, in percentages, in such a way that they can help to answer three questions:

Is the event likely to happen?

Does the happening of one event make another event more or less likely?

Is that likelihood great enough to justify action now?

1. *Select the events.* Seek judgements from a number of experts. Take all of their judgements and average them to get a probability estimate that is assumed to be more accurate than a single estimate would be.

2. *Estimate independent probabilities.* What is the probability of event ''A'' occuring prior to event ''B'' or ''C?''

3. *Estimate percentage probable influences of event ''A'' on event ''B.''* What will be the probabilities of event ''B'' occuring subsequent to event ''A?''

4. *Summarize estimates.* Display study results on a matrix, using an arrow pointing upward to show cases in which event ''A'' would increase the chance of event ''B'' occuring, and an arrow pointing downward to show cases in which event ''A'' would decrease the probability of event ''B'' occuring.

5. *Interpret the findings.*

Will one event likely influence the chances for another?

What are the chances that this chain of events will come about?

Use judgment to decide if the probabilities are great enough to warrant concern.

Considerations in Cross-Impact Analysis

The numbers are not magic. The numbers that result in the matrix are not absolute probabilities that things will happen. Rather, they are estimates that let us examine the relative size of different possible outcomes. The numbers mean nothing until they are interpreted. An 80 percent probability of rain is unimportant to a student with classes that day. A 25 percent probability of rain, however, might prompt a farmer with hundreds of thousands of dollars in crops to begin harvesting.

The analysis works one way. To estimate the percentage probability of event "B" occuring and then influencing the percentage probability of event "A," the analyses would have to be undertaken separately.

The analysis is as good as the logic behind it. It is crucial to select the right factors for study, and to be correct in assuming that one is a logical, probable cause of the other. It makes no sense to do cross-impact analysis factors that do not break out into cause-and effect. It also makes little sense to look at impossible (probability of zero) or inevitable (100 percent) events.

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TIP Sheet 7
Preference Surveys

A preference survey is a technique to expand the involvement of persons in providing input to the creation of desirable visions of the future. A preference survey is just that—soliciting peoples' opinions, desires, wishes, or values about their preferred future for a particular situation or environment.

It may be desirable to conduct a Delphi analysis (a technique explained in Unit III, "Projecting and Forecasting") in the form of a preference survey among experts, as well as a preference survey among a broad range of citizens. In some cases, the survey is designed to collect further images for the planning process itself. In others, it is designed to determine the amount of support for specific images or plans. Sometimes, multiple visions of development are presented in a survey, with opportunity for respondents to provide their preferences and comparisons among the choices, or to add to the images or visions of the future.

Statistically, it is desirable to gather expressions of preferences from all those who could be affected by implementing images of the future. More often than not, this approach is logistically impossible. Therefore, one must either use a random sample or a categorical sample. Random samples are helpful in defining common agreement within a total population.

To create a categorical sample, we select respondents from groups or categories of people whom the researcher anticipates will have quite different views from the population as a whole. For instance, an Extension educator who is planning a survey on "Goals for Our County in the Next Century" might draw a categorical sample from different types of voluntary associations, civic and cultural clubs, on the assumption that it is important to include their views, since they would probably play an important role in setting and implementing these goals. Comparisons of preferences among the different groups usually is quite helpful in identifying how groups may differ in their values and preferences. Random samples, on the other hand, are helpful in defining common agreement of a whole population.

An additional way to view the selection of categorical samples is suggested by Linstone and Simmonds (1977), who point out that persons with a personal perspective have concerns and values that differ from those who take an organizational perspective or a technical perspective. Personal concerns usually are voiced by the individual citizen, service user, client, or program participant. Organizational concerns usually are expressed by administrators, employees, funders, and stockholders. Skilled workers, professionals, and scientists view situations through technical concerns. Class, ethnic, and age categories also can be used to assure diversity in categorical samples.

Another challenge in conducting a preference survey is that of asking the right questions in the right way. In some cases, open-ended questions can elicit responses on what people would like to see happen. In other cases, a survey might show alternatives as pictures or drawings of what the future object, environment, or organization could look like. In still other cases, in which the choices have been narrowed to specific alternatives, the alternatives can be explained in detail. Preference surveys provide the opportunity to involve people in creating a vision and can draw forth their support, as well as educate them regarding alternatives.

Purpose

Preference surveys are used to identify aesthetic, ethical, life-style, or environmental preferences of various constituencies regarding activities, objects, events, places, organizations, or community policies. The findings are used to make comparisons between the preferences and existing situations. The survey process can generate consensus and support regarding future images and goals toward which persons and groups will contribute.

Procedures

There are many forms of preference surveys. However, in all of these, the procedures include the following general steps:

1. Identify the focus of the preference survey, the decision to be made, areas to be explored, and general questions to be asked.

2. Identify either a random or representative sample of populations that represent at least three perspectives: (a) personal, (b) organizational, and (c) technical.

3. Survey the sample groups through mailed questionnaires, or individual or group interviews. Informants are asked to respond to open-ended questions, matched pairs of alternatives, or rank orders of alternative proposals. Be sure the questions provide the needed information and are appropriate for your respondents.

4. Analyze the data by contrasting the various perspectives that are represented. Identify both common preferences and those that are held by specific groups.

5. Use the findings as a basis for dialogue leading to decisions to support particular preferences.

6. Generate action plans that are consistent with the common preferences among the decisionmakers, special interests, and persons most affected. Allow enough time and opportunity to achieve the needed compromise and consensus.

References

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TIP Sheet 8
Values Audits

The values audit, a relatively new invention technique, is used to generate a positive vision of the future of an individual, a family, or an organization through identifying and clarifying values. Action to strengthen particular values is then encouraged. Described as an offshoot of the corporate social audit, which is an attempt to assess the types of human concerns that are immediately apparent to employees, values audits have been applied to universities, colleges, and continuing education organizations. The audit is a clearly stated attempt to reflect an organization's value concerns and visions of social well-being among its members, and to build on those aspirations for organizational development. Although values audits have been used by organizations, individuals and families also could use the same procedures.

Organization values audits focus on the values that are "at stake" in key decisions and areas of institutional policy (Smith, 1984). Not only does the technique strive for a better understanding of the culture of an organization, but the values audit should lead to an ongoing process in which decisions are examined with relation to identified values that are to be strengthened for the sake of creating a more desirable future.

In the past, organizations have been understood as structures, rules, and policies. After a time, they were studied as human resources and human relations systems. Still another way of viewing organizations is through their policies, influence patterns, and power relationships. More recently, organizations are being viewed as distinct cultures with values, rituals, celebrations, and norms that provide a clue to motivation and the way people feel. A values audit attempts to tap into these cultural aspirations and then to look at the structures, the human resources, and the political influences that may be in contradiction to what the members or employees of the organization want or imagine for the future. The discrepancies between what people say they value or what they envision for the future, and the way they or their organization operate, may provide the incentive for positive change.

Purpose

The purpose of a values audit is to identify basic positive values and images of the future for an individual or an organization; to reflect upon, discuss, and identify implications for those values and images; and to institutionalize the positive vision of the future by strengthening selected values that are perceived at the core of the positive vision.

Procedures

The general steps of a values audit for an organization are the following:

1. Form a values audit steering committee drawn from representatives of all areas and levels of the organization.

2. Conduct a values inventory on the way members of an organization perceive the values of an organization, and the values they would like the organization to conserve or emphasize in the future. This may be done through group or personal interviews, or mailed questionnaires. Often, an external consultant provides leadership for the audit, to increase objectivity, or to lessen the threat to organization members who might be seen as "rocking the boat." Including as many persons as possible is the best way to assure success.

3. Conduct an analysis of the data collected from the values inventory. A values inventory report is written and distributed throughout the organization.

4. Encourage dialogue among members, units, or levels within the organization in response to the inventory report.

5. Select values that members, units, and levels collectively can affirm and strengthen.

6. Commission or invite organization members to write papers on each of the selected values. In these papers, the writers should describe visions of the organization that fulfill the selected values. The papers are used to focus attention on implications for action for the organization and its future.

7. Institutionalize new organizational policy and procedures that are congruent with the consensus on those core values to be strengthened. Continue dialogue about emergent value concerns.

A values audit conducted with individuals or families would include the following steps:

1. An agreement to undertake a values audit is negotiated between an educator and participants.

2. With the help of the educator, participants identify and list the values that they would like to emphasize in their future. Reflection on past positive experiences can help the process. Introspective tests or questionnaires also can be used.

3. Participants are encouraged to write, in detail, the implications of the values for a vision of their future and for specific behaviors and decisions that would be required to strengthen those values. These descriptions are then used to make contrasts between the way persons behave in the present and the decisions they are now making.

4. Participants develop plans for making present behaviors and decisions conform to the value-enhanced vision of the future.

A values audit in an organization is rather broad-based, and, as such, lends itself well to long-range concerns. To date, the Society for Values in Higher Education has conducted values audits in eight colleges and universities. The technique can be used by almost any organized group that wishes to reflect on the values that characterize its aspirations and that hold the group together.

Reference

Smith, D. 1984. ''Program Improvement Through Value Audits.'' In J.D. Deshler (ed.), *Evaluation for Program Improvement.* San Francisco, Calif.: Jossey-Bass, Publishers.

TIP Sheet 9
Images and Imaging

The imaging technique that follows is drawn, almost entirely, from the work of Ziegler. Since the description of this technique in this TIP Sheet is quite brief, additional information may be obtained from The Futures-Invention Associates, 2026 Hudson Street, Denver, Colorado, 80207.

Ziegler describes futures-invention as "an art," sometimes difficult to practice, that uses the language of images and builds on the motive of strong human intentions to enable persons to invent a future that has not previously existed. Furthermore, (Ziegler (1982a, p. 9) its aim is "to help people to bring into existence a not-yet-occurred state of affairs; to fashion, to create, and to design new practices, new institutions, new ways of being and doing within the context of their concern." He warns that the more the process is rushed, the more likely that imperfect, even false images of the future are generated.

Purpose

The purposes of the imaging technique are to generate and expand concrete possibilities and options for choice for the future. Some of these possibilities and options will motivate persons, families, groups, organizations, and community leaders to bring into existence a not-yet-occurred state of affairs; to fashion, to create, and to design new practices and new institutions; and new ways of being and doing within the context of their concern (Ziegler, 1982b).

Procedures

The general procedure for imaging, summarized from Ziegler (1982b, 1985), includes the following steps:

1. Identify the individuals, groups, or organizations that can contribute to a process of imaging a positive future for a specific concern.

2. Begin, in a workshop setting, by identifying and focusing on specific concerns each participant has for the future. These can be listed on newsprint or a chalkboard.

3. Identify participants' common concerns, through sharing and identifying, so that collaboration among those with similar concerns can occur through the remainder of the process.

4. Demonstrate that participants can and do image, when they recall concrete mental pictures of interesting or important experiences from their own personal past. They are to practice bringing forth images, letting them flow, and capturing them in word pictures so that someone else can "get the picture." Recollections of good times and places, positive learning experiences, and events of achievement or risk taking are good places to start.

5. Generate concrete images of the future in general categories or domains of human experience: learning and education, governance, family, religion and spirituality, work, and community. Participants should not interrupt the process by raising practical questions about feasibility, probability, believability, and so on, at this point in the process.

6. Share images of the future in small groups. Listen carefully and sensitively to others. This conversation is like story telling in an atmosphere that is supportive, empathetic, probing, and positive rather than disbelieving, judgmental, argumentative, suspicious, and negative. The mood should encourage enjoyment of differences among the various images.

7. Initiate focused imaging of the future. Participants take the concern identified at the outset and generate clear, concrete, specific images that are anchored with examples of who is doing what, with whom, when, where, how, and why. They are to look around in that future and render it present by living it and identifying specific objects and events that could be used as evidence, in the future, that they have happened. These focused images of the future are to be written down, in detail. Those descriptions become the building blocks for later inventions.

8. Participants receive feedback on focused image descriptions in small groups. With as open a mind as possible, listeners hear the vision of the future and participate in it in their imaginations by living, tasting, and feeling the images without judging them. They then interpret what they are hearing, and make analytic, plausibility, and preference judgments about whether the vision of the future makes sense, seems plausible, and mirrors their preferences. Comments should reduce possible confusion or misinterpretation. Through this feedback, participants receive new perspectives on their images.

9. Search the focused images for an underlying central theme or themes. Identify those images that have so captured participants' imagination that they will not be able to dismiss or forget them. Participants can ''test'' an image by mentally moving into it and living it.

10. Engage in story telling in the large group, asking participants to report their most compelling images on newsprint: words, phrases, indicators, songs, dances, diagrams, pictures, and symbols. Identify images of the future that share a central, common, or compatible vision.

11. Form collaboration or imaging teams among those who have discovered central, common, or compatible visions of the future. Without losing their individual visions, team members work together to create common, compelling images by filling in details on institutions, sectors, domains, delivery systems, technology, work roles, family roles, and citizen roles and activities. Agreements are to be written down. Discussion takes place in the future time to make the visions come to life. Break teams into subteams, if fundamental disagreements arise.

The imaging process is a practice, a discipline, and a literacy. It means paying attention to what is important and letting one's imagination take wing. The analytical tasks of sorting out false and weak images have been created. The process alternates between imaging as individuals and then sharing with others what is personally created, first in small and then in larger groups. This alteration provides a balance between the internal, intuitive process of creativity and the creativity that can emerge through dialogue and collaboration. The process requires a facilitator who can establish a learning climate that supports searching, listening, clarifying without being judgemental, collaborating, and sharing.

Ziegler (1985) suggests 10 rules that comprise what he calls the ''grammar of imaging.'' They are:

- Rule 1. Be concrete and specific.
- Rule 2. Do not interpret your image.
- Rule 3. Yield to your images; let them flow.
- Rule 4. Shift one or more variables or factors in your image and discover what happens.
- Rule 5. Withhold plausibility and preference judgments about your images; do not censor.
- Rule 6. Return to your image when in doubt.
- Rule 7. Feel the image; internalize it.
- Rule 8. Never force the image.
- Rule 9. Always be prepared for new images.
- Rule 10. Move into the time and place of the image and live it.

References

Ziegler, W. 1982. *A Mindbook of Exercises for Futures-Inventors.* Denver, Colo.: The Futures-Invention Associates.

Ziegler, W. 1982. *A Mindbook for the Citizen Leader.* Denver, Colo.: The Futures-Invention Associates.

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TIP Sheet 10
Scenario Building

Scenarios are disciplined and structured judgments, as to the course of possible futures, that describe structurally different future environments. They are focused views of the future, geared to the needs of specific decisionmaking, i.e., alternative images of the way the future could materialize. Scenarios can be prediction or prevention tools, if they help to uncover some insight into events that might otherwise be overlooked (Ehrlich, 1973). They are explicitly designed to deal with the interconnections among social, economic, political, and technological forces. They can show the ways in which the ''micro-environment'' might be affected by different ''macro-futures''—the broad sweep of societal forces (Wilson, 1978).

Scenario building is the inventing of new ways of being, doing, feeling, and thinking; new programs and practices; new cultural forms; and new institutions and organizations, policies, resources, and instruments of action. Scenario building helps us ''try out'' our projections, proposed actions, and focused images for size and feel. Through scenarios, we can make a design or several alternative designs and rehearse their operation. Scenarios provide us with an instrument for learning (Ziegler, 1982a).

A common concern of those who are building scenarios is their plausibility. Some scenarios may, at times, be difficult to tether to the reality of the present. On the one hand, what is required is to let the mind and the imagination loose. On the other hand, the creator must never ''cut the cord'' to reality, if the outcome is to be deemed plausible.

Ziegler (1982a, p. 22) identifies several elements in scenarios. These elements are:

- A clear statement or formulation of the goal of the intended action.
- Imaginative indicators of the achievement of goals so that we know or can evaluate when we have achieved our results.
- A map of the consequences of the invention or intervention that sets forth the unintended effects or impacts.
- A reasonably detailed description of the instruments that are designed to achieve the goal: the means, the methods, the strategies, and the consequences of their use.
- A clear statement of the underlying assumptions, rationales, and values embedded in the scenario.
- A description of the groups involved in and affected by the scenario.

Purpose

The purposes of scenario building (detailed descriptions of the future nature and scope of unfolding potential events, objects, and processes) are (1) to identify an alternative hypothetical series of events or products that could possibly materialize; (2) to test the way the parts fit together; (3) to develop insights into events that might otherwise be hidden; (4) to discover interconnections among events and forces; (5) to note the potential effects of macro-events on micro-environments; and (6) to contribute to specific decisions in the present.

Procedures

The basic steps outlined here for scenario building are a combination of those suggested by Wilkinson (1983) and those of Ziegler (1982a):

1. Set forth a clear, bold, vigorous goal statement for the image or general vision of the future. This statement describes a not-yet-occurred state of affairs that the scenario builder proposes to bring about, something that ought to be done or brought into existence. Do not limit the goal statement to what is practical, feasible, fundable, or safe. The scenarios will reveal those limitations.

2. Imagine the indicators that tell the scenario builder that the goal has been achieved. One helpful way to do this is to move imaginatively into the future; make it present; and live it. This transference enables the scenario builder to identify behaviors, practices, organizations, and settings, each with specific details that can anchor the goal statements so others can tell when goals will have been achieved.

3. Reflect on and specify the assumptions that underlie the image, proposed intervention, or plan. Describe the rationale that justifies it; identify the values that are expressed in it; and consider competing values.

4. Describe the persons or groups that must or will be involved. Identify those who are affected (benefited, hurt, influenced, changed, ignored); the implementors (professionals, technicians, financiers, supporters, employees); and the policymakers and decisionmakers (family members, citizen groups, public officials, administrators, employers). In some scenarios, the elements in the physical ecological system must be identified.

5. Identify the decisions to be addressed in the planning process. These decisions define ''what it is'' about the future that scenario builders would like to know, and so become the focus for the scenario. Often, decisions have to do with which approach provides the most benefits or results with the least harm; how much should be undertaken; where and when something should occur; or which sequence of development is best.

6. Describe the strategies, means, methods, tools, instruments, or equipment that will be needed to achieve the goal.

7. Select several logics that will give coherence to the scenario and result in structurally different views of the future. For example, one scenario on workplaces of the future might "assume" extensive growth in information technology. Another scenario on future workplaces might "assume" severe energy shortages. Creating alternative scenarios for key decision alternatives will provide an opportunity to explore the potential consequences of these key decisions. This is the key step in the whole scenario building process, and can be achieved by (1) focusing, first, on those key forces that represent the maximum degree of criticality and uncertainty; and then (2) ascribing alternate logics that explain why and how these selected forces might take different trajectories. We can think of these as being different "theories of how the world works."

8. Elaborate a set of scenarios (typically three to five) based on these driving forces and logics. For each scenario, describe how all the relevant macro-environmental forces and decision factors might be affected by the prevailing conditions of that scenario. This means figuring out what might happen as a result of successful implementation of a goal under the limitations of each alternative scenario.

9. Identify the decisionmaking implications of each scenario, i.e., the potential opportunities and threats to be weighed in making the decision. This also means identifying unanticipated consequences, effects, and impacts, and the potential scope of them for specific groups: those identified in the initial steps to this process. Since not all consequences are neutral, special attention must be paid to those who might be harmed or who might oppose any effort. It may be helpful to assign a positive (+) or a negative (−) symbol to each consequence for each constituency or person involved or affected.

Scenarios are most helpful in identifying a broad range of forces and potential consequences that should be considered before initiating serious efforts to implement an image or a plan.

One last word: a sense of ownership is important if scenarios are to be useful in the long-range planning process. Participants need a significant amount of time to develop their scenarios, if this technique is to be related to key decisionmaking.

The foregoing scenario building technique is drawn, almost entirely, from the work of Ziegler. Since the description of this technique in this TIP sheet is quite brief, additional assistance from The Futures-Invention Associates may be desirable (The Futures-Invention Associates, 2026 Hudson Street, Denver, Colorado 80207.)

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Erlich, P. 1973. "Speculative Scenario." In F. Tugwell (ed.), *Search for Alternatives: Public Policy and the Study of the Future.* Cambridge, Mass.: Winthrop Publishers.

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Wilson, I.H. 1978. "Scenarios." In J. Fowles (ed.), *Handbook of Futures Research.* Westport, Conn.: Greenwood Press.

Ziegler, W. 1985. *A Mindbook for Community Envisioning.* Denver, Colo.: The Futures-Invention Associates.

Ziegler, W. 1982. *A Mindbook of Exercises for Futures-Inventors.* Denver, Colo.: The Futures-Invention Associates.

TIP Sheet 11
Futures History Writing

Futures history writing, as a technique, was created by Ziegler (1982a) to assist participants in futures-invention to make a transition from the scenarios they have created to action plans. Futures history writing is a way to connect the future with the present through identifying the necessary linkages that will have to be made to realize the operation of a specific scenario.

The technique of futures history writing builds on the concept of the "future present moment," the capacity to put ourselves into a specific time and place in the future, and to live that future as if it were the present. Through imagination, the intended future has happened. While standing firmly (mentally) in that future place and time, a question is asked: "How did all of this [the scenario] come about?" or "How did it happen?" This technique provides a vantage point of looking backward to the present to find out what happened to bring about an intended future. By evoking an imaginary memory, a multiplicity of events and a wide array of alternative pasts are brought into consciousness.

What will be "remembered"? Memory is used to provide the concrete events, actions of persons, organizations, institutions, and societies. The content of our memories is quite specific: happenings, specific instances, milestones, stages of development, breakthroughs, changes, discontinuities, and so on, in cultural, scientific, political, economic, intellectual, and personal areas. These events are sorted in a logical sequence and written as a record for specific time periods. This technique is a special form of imaging and requires the application of the 10 rules that were listed as a part of the content on "Images and Imaging."

Purpose

The purposes of futures history writing are (1) to generate conscious awareness of the wide range of events and happenings that are likely to link the intended future image or scenario to the present, and (2) to view these in some ordered, sequential stages of development.

Procedures

The procedures for futures history writing include the following eight steps:

1. Participants place themselves, through imagination, at a specific point in time in the future to live a scenario or intended image of the future as a "future present moment." From this stance, they ask, "How did it happen?"

2. Participants compile, through the use of their imaginary memory, a long list of specific concrete instances, events, happenings, milestones, stages of development, breakthroughs, changes, or discontinuities in cultural, scientific, political, economic, intellectual, and personal areas that might have contributed to the imagined future.

3. Participants record the items from their memory search into a plausible sequence, as a historical record, in which are identified milestones for each of up to seven time periods of four or five years each.

4. Participants review the futures history document for discontinuities and gaps.

5. Participants return to imaging, when necessary to create new material for making adjustments and additions.

6. Participants share their futures history documents with others, and receive feedback from careful readers.

7. Participants collaborate in creating futures history documents for scenarios that contain common interests and concerns.

8. Futures history documents then are used as a springboard for specific action planning.

The process can be repeated for alternative scenarios or images of the future to test their desirability, plausibility, and feasibility.

Since the foregoing description of the futures history writing technique is quite brief, additional assistance from The Futures-Invention Associates may be desirable (The Futures-Invention Associates, 2026 Hudson Street, Denver, Colorado 80207).

References

Ziegler, W. 1982a. *A Mindbook of Exercises for Futures-Inventors.* Denver, Colo.: The Futures-Invention Associates.

Ziegler, W. 1982b. *A Mindbook for the Citizen Leader.* Denver, Colo.: The Futures-Invention Associates.

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TIP Sheet 12
Action Planning

Ziegler (1982b) describes action planning as a set of exercises that enable the futures-inventor to respond intelligently, knowledgeably, and with commitment to the question: "How may we best begin to live our intended futures in the present?" or "What can we begin in the here-and-now that will move us toward and into those futures?"

Purpose

The purpose of action planning is to enable participants in the futures-invention/creation process to begin present steps toward their intended futures.

Procedures

The action-planning process, according to Ziegler (1982) consists of the following steps:

1. Set short-term, detailed, concrete objectives that describe movement toward intended futures, and that are specific to action settings (environment where something can be done to achieve these objectives).

2. Identify action groups (those who are influenced; those who carry out policies, programs and initiatives; and those who make decisions) necessary to initiate action toward intended futures.

3. Correctly identify and analyze enhancers and inhibitors (forces or factors that affect the entire action process), and select those that can be influenced by participants.

4. Identify resources by naming persons, roles, organizations, institutions, and the actions that each can or will perform for movement toward intended futures.

5. Design instruments and action plans by stating clearly who does what, to or for whom, under what conditions or circumstances, with what resources, for what purposes. In addition, to whom, what, and how does accountability occur, what types of evaluation instruments will be used?

Setting Short-Term Objectives

Cooperative Extension used to plan its program objectives on a year-to-year basis. More recently, the emphasis has shifted to setting objectives for major program plans of work on a four-year or five-year basis. According to Ziegler (1982b), a future planning period of five or fewer years is considered short-term for setting program objectives.

What are these objectives? They are not-yet-occurred states of affairs that, when undertaken, describe the practices, organizations, institutions, interpersonal contexts, and so on, that bring to life the various aspects of the images in the scenarios. Learners are encouraged to look into their images, their scenarios, and, most important, their futures histories to locate "do-able" components that need not wait 20, 30, or 40 years for their realization. As they go through the other steps, participants are to keep in mind that the first statement of objectives may be modified. There is a creative tension between the present contingencies and the intended future.

Participants are to describe short-term objectives in detail, with concreteness and specificity. Action settings, the spaces where something can get done to achieve these objectives, also are specified. A full description of an action setting includes references to beliefs, values, costs, payoffs, key roles, and systems of rewards and punishments. Access to action settings may be gained by virtue of membership, employment, kinship, credentials, competence, common goals, ethnicity and other factors. Describing these carefully helps fit together the objectives and the action settings.

Identifying Action Groups

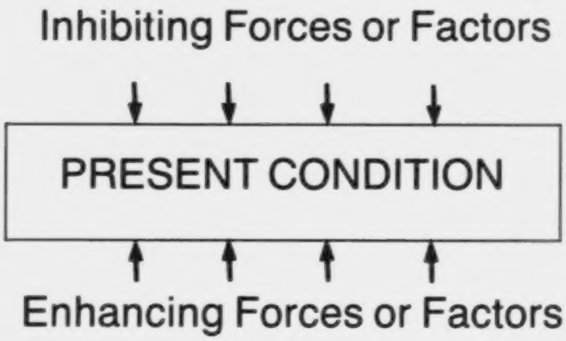
Identifying action groups begins with the question: "Who are the main actors in one's images and scenarios, in futures histories, in short-term objectives, and in action settings?" or "Who are the persons, groups, organizations, and institutions involved in the action and movement?"

Ziegler (1982b) states that there are, first, groups of persons who are to be influenced or changed in ways specified in the short-term objectives. The second group consists of persons, groups, and organizations that effect the new policies, programs, and initiatives. These entities undertake the actions that bring about the short-term objectives. Their willingness and ability to carry out the action plan in question may well determine its success or failure. The third group consists of decisionmakers. These persons may overlap with the first two groups. Their approval is necessary to initiate the actions called for in the action plan. They may be the policymakers, citizens, organizational leaders, elected or appointed officials, and so forth. These persons or groups are to be specified, along with their interests, their characteristics, and their relevant systems of sanctions and rewards.

Analyzing Enhancers and Inhibitors

Kurt Lewin (1947), for purposes of research, proposes that intended action be viewed as affected by facilitating and restraining forces in juxtaposition. He suggests that, if we weaken the restraining forces, the facilitating forces will move us toward our goals. This approach consists of identifying the forces, and then selecting those we can influence. Ziegler (1982a) expanded on this idea, applying it to the analysis of futures-invention goals.

Ziegler suggests that, in the final analysis, successful action-planning depends upon the correct identification of the factors that enhance or inhibit the entire action process and movement. These factors are the "levers" or "pry points" for effective action. To identify these forces, Ziegler suggests that learners and planners look to themselves to identify the enhancers and inhibitors to action. Another way to identify forces is to review the identified action groups that were identified, and to specify the factors that may hold back support from each. Scenario building exercises, particularly the consequence mapping, are likely sources of factor identification. The same underlying factors for each scenario are probably at work across different time frames. While this analysis proceeds, keep in mind that the objective of action planning is to neutralize the inhibitors and encourage or "free" the enhancers so that they can be brought into play. This task is depicted here as arrows (forces to be named) moving toward each other.



The force field analysis figure and similar schematics are helpful in synthesizing complex influences on each scenario. These forces or factors, once named, become the bases for resource identification and the design of instruments and actions.

Working With Our Publics

In-Service Education
for Cooperative Extension

Module 7
Techniques for Futures Perspectives

Transparency Masters

Working With Our Publics: In-Service Education for Cooperative Extension

Module 1: Understanding Cooperative Extension--
Our Origins, Our Opportunities
David R. Sanderson
University of Maine, Orono

Module 2: The Extension Education Process
Richard T. Liles and R. David Mustian
North Carolina State University at Raleigh

Module 3: Developing Leadership
Lee J. Cary and Jack D. Timmons
University of Missouri, Columbia

Module 4: Situational Analysis
Laverne B. Forest
University of Wisconsin-Madison

Module 5: Working with Groups and Organizations
Betty L. Wells
Iowa State University, Ames

Module 6: Education for Public Decisions
Verne W. House
Montana State University, Bozeman
Ardis A. Young
Washington State University, Pullman

Module 7: Techniques for Futures Perspectives
J. David Deshler
Cornell University, Ithaca, New York

Why the Public Should Generate Futures Perspectives

- * Right Of Access to Information
- * Contribute to Planning
- * Protect Public Interests
- * Create an Informed Public
- * Envision Futures

Purposes Of Module 7: Techniques for Futures Perspectives

1. To enhance the capabilities of Cooperative Extension professionals to understand and use techniques for generating futures perspectives as part of their educational activities.

2. To assist Cooperative Extension's various publics to know and use these techniques for generating futures perspectives.

Objectives For Module 7: Techniques for Futures Perspectives

- * Comprehend Cooperative Extension's Role.
- * Gain a Broad Overview of Futures Literature.
- * Value a Future Orientation to Extension's Work.
- * Appreciate Differences in Time Perspectives.
- * Know the Four Approaches to Futures Perspectives.
- * Recognize Applications of Techniques for Situations.
- * Introduce, Recommend, and Facilitate Technique Use.

Definition of Techniques for Futures Perspectives

Techniques for Futures Perspectives Include Any Systematic Activities or Processes That:

- * Increase Our Motivation to Anticipate and Learn About the Future;
- * Improve Our Understanding of Trend Implications;
- * Alert Us to Anticipate Consequences of Actions, Plans, Decisions, And Policies; or
- * Enhance Our Vision of a Desirable Future Toward Which Our Activities Can Be Directed.

Approaches to Generate Futures Perspectives

* Anticipatory Learning

* Projection and Forecasting

* Prevention and Adaptation

* Invention and Creation

Techniques for Futures Perspectives: Cooperative Extension's Opportunities and Role

- Extension Organization and Extension's Publics
- Land-grant Institution Futures Research Methods
- Process Skill Programming
- Orientation: Reactive--Proactive
- Informed Citizens
- Bridges: Technologists--Decisionmakers--General Public
- Democratic Decisionmaking
- Alternative Visions: Determinists--Utopians
- Extension Process Roles

Who Can Make Use of Techniques for Futures Perspectives?

Extension's Own Organization:

- * County Strategic Planning Task Forces
- * State Extension Future Issues Task Force
- * County Program Planning Committee
- * Sea-grant Program Planning
- * Institution Department/Agent Program Committee
- * Professional Associations

Who Can Make Use of Techniques for Futures Perspectives?

Extension's Publics:

* 4-H Volunteers and Youth
* Individuals and Families

* Voluntary Associations and Organizations

* Commodity Councils

* Cooperatives

* Human Service Agencies

* Educational Institutions

* Business Organizations

* Councils of Organizations and Agencies

* Local Government Units

* Planning Departments

Purposes of Anticipatory Learning

1. Free Persons From Socially Imposed Expectations;
2. Introduce Alternative Futures Perspectives Through Literature, Media, and Games; and
3. Provide Opportunities to Assess Ethical and Moral Decisions That Have an Impact on the Future

Capabilities Required for Anticipatory Learning:

- Overcome Resistance to Futures Thinking
- Reflect on Social Assumptions
- Image Positive Future Conditions
- Evaluate Consequences of Decisions
- Consider Side Effects and Unintended Effects
- Recognize Relationship of Wholes to Parts
- Detect Interrelationships of Events
- Make Plans and Strategies

Ways We Avoid Thinking About the Future

* We Don't Have Time To Think
About the Future Now.

* We Will Think About the Future Tomorrow.

* Don't Interrupt Our Routine.

* Whatever Will Be Will Be.

* Technology Will Save Us.

Results of Futures Thinking Avoidance

* Expediency

* “Muddling Through”

* “Learning By Shock”

* Endangerment of Future Generations

Incentives for Futures Study

- * Worthwhile Goals
- * Negative Outcomes
- * Motivation
- * Human Destructiveness
- * Options and Possibilities
- * Future Generations
- * Emerging Opportunity
- * A Planetary Ethic
- * Curiosity and Imagination
- * A Common Good

Developmental Stage Time Perspectives

Year(s)	
1	Permanence of Objects and Persons
1-3	Clock Time
3-5	Restriction Time
6-11	Causal Sequences
12-15	Personal Time
15-25	Mutual Time
18-25	Alternatives In Time
25-40	The Uses of Time
40-50	Reconsidered Time
50-60	The Foreshortened Future
65-On	The Rich Past

Qualities of Futurist-Oriented People

- * Balanced Perspective
- * Empirical Perspective
- * Believes in Creating the Future
- * Innovative
- * Stimulated by the Future
- * Global Perspective
- * Challenged by Uncertainties
- * Imaginative
- * Modest Forecaster
- * Seeks Diverse Information
- * Careful Risk-taker
- * Holistic Perspective
- * Process-oriented
- * Creative
- * Self-defined Futurist

Techniques for Anticipatory Learning

- * Self-directed Learning: Futures Literature
- * Visual Reflection: Futures-oriented Media
- * Reading and Dialogue: Fictional Futures
- * Futures Games and Simulations

Questions on "Touring Futures II: A Literature Guide to Futures Studies for Cooperative Extension"

*** Which Authors Have You Met Before?**

*** What Tips for Tourists are Surprising?**

No Qualifications to be a "Futurist"

There Is No Futures "Field"

There Are No Magic Techniques

Distinguish Between Forecasts and Proposals

Avoid Pollyanna and Cassandra

Futures Thinking Is Subversive, Conserving, and Amusing

Most Forecasts Are Likely To Be Wrong

*** Which Tours Interest You?**

Overviews and Introductions

Society and Technology

Natural Resources

Human Resources

Procedures for Visual Reflection: Futures-Oriented Media

1. Identify Future Concern or Dilemma
2. Select Visual Media
3. Assign Questions Prior to Viewing

    Feelings About the Future?
    Valued Visions of the Future?
    Accurate Projections?
    Consequences To Be Avoided?
    Ethical or Moral Issues?
    New Images Worth Considering?

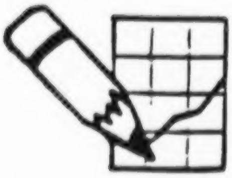
4. View the Media
5. Share Observations, Judgments, and Concerns
6. Identify Choices

Procedures For Reading and Dialogue: Fictional Futures Literature

1. Obtain Commitment
2. Identify Dilemmas
3. Select a Common Fictional Futures Work
4. Take Notes on Issues, Images, Values, and Choices
5. Discuss Futures Perspectives Revealed in Novels
6. Compare Perspectives
7. Identify Choices

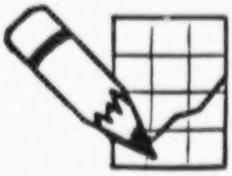
Procedures for Futures-Oriented Games and Simulations

1. Set Educational Goals
2. Select Games That Relate to the Goals
3. Explain the Educational Objectives
4. Facilitate the Game or Simulation
5. Encourage Dialogue
6. Identify Choices



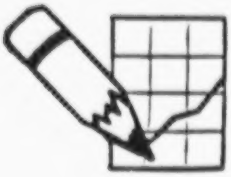
Limitations of Forecasting Techniques

* No Regularities of Events
* Significant Variables Omitted
* Long-term Projections
* Trust Computers
* Quality Guaranteed by Complexity



Activity Sequence for the Use of Forecasting

1. Establish Priorities
2. Identify Relevant Forces
3. Identify Data for Indicators
4. Project from Data for Each Relevant Force
5. Draw Implications from the Forecasts
6. Devise Strategies for Action



Techniques for Projection and Forecasting

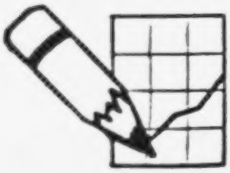
* Historical Precedent

* Delphi Analysis

* Trend Extrapolations

* Cross-impact Analysis

* Computer Uses and Limitations



Purposes of Delphi Analysis

Forecast Long-range Trends

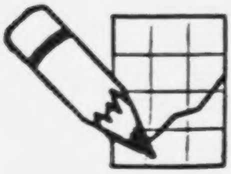
Forecast Technology Development

Obtain Probability Judgments on Events

Interpret Trend Extrapolation Data

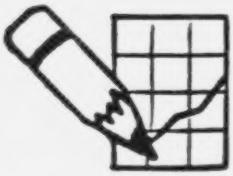
Generate Policy Alternatives

Assess Possible Consequences



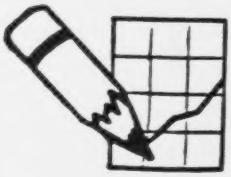
Procedures for Delphi Analysis

1. Form a Monitoring Team
2. Select One or More Panels
3. Develop First-round Questionnaire
4. Pre-test the Questionnaire
5. Administer First-round Questionnaire
6. Analyze First-round Responses
7. Prepare Second-round Questionnaire
8. Administer Second-round Questionnaire
9. Analyze Second-round Responses
10. Prepare Analysis Team Report



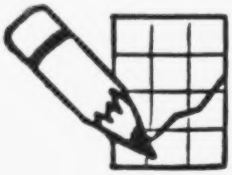
Advantages Of Trend Extrapolation

- Easy to Execute
- Cost-effective When Data are Available
- Insights on Patterns of Events
- Credible Projections for Regular Events



Steps Involved in Trend Extrapolation

1. Establish the Problem of Concern
2. Identify Specific Numerically Indexed Indicators
3. Acquire Data on Each Indicator for Time Periods
4. Plot the Data Points for Each Time Period on a Graph
5. Project the Line on the Graph Into Future Time, Taking Into Consideration the Overall Pattern of the Line
6. Identify Possible Implications from the Trend.
7. Create an Action Strategy Based on Trend Implications



Advantages of Cross-Impact Analysis

* Expresses Probability of Impacts of One Event on Another

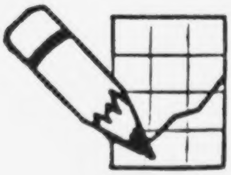
* Uncovers New Information

* Uses Delphi-generated Expert Opinion

* Assists Thinking About Effects of Potential Policies

* Reveals Cumulative Effects on Whole Systems

* Useful for Market and Product Opportunities, Foreign Policy Issues, Institutional Goals, Natural Resources, Defense, Ecology, Education, and Other Areas



Procedures for Cross-Impact Analysis

1. Define Events Included in the Analysis
2. Estimate Initial Probability for Each Event
3. Estimate the Probable Influence of Each Event on Other Events Being Considered
4. Specify the Estimates for Each Space in the Matrix
5. Summarize the Overall Estimates for Each Event
6. Interpret the Findings

Categories of Impact Assessment

- * Economic Impact Assessment
- * Technology Impact Assessment
- * Environmental Impact Assessment
- * Social Impact Assessment

Definition Of Risk

Risk is the Possibility of Suffering Harm or Loss, or the Factor, Element, or Course That Involves Uncertain Danger or Hazard.

Definition Of Impact

Impact: The Effect of One Thing on Another

- Primary Impacts-- Direct Results of Action or Event

- Secondary Impacts-- Results of Primary Impacts

- Indirect or Related Impacts-- Results That Are Unseen or Not Immediately Apparent

Examples of Economic Impact Categories

* Employment Opportunities

* Tax and Property Value Changes

* Tax Revenue--Cost of Local Government

* Displacement of Business-Farms

* Industry-Business Activities

* Disruption of Community Growth

* Cost of Living--Standard of Living

* Long-Term Productivity

* Energy Requirements

* Energy Conservation

Examples of Technology Impact Categories

- Computers
- Biotechnology
- Military
- Food Processing
- Waste Treatment
- Shoreline Fishing
- Agricultural Productivity
- Mining and Ocean Minerals
- Construction And Housing
- Water Supply
- Medical
- Nuclear Energy
- Transportation
- Energy
- Forest Resources

Examples Of Environmental Impact Assessment Categories

- Air Quality
- Noise Pollution
- Water Resources
- Wildlife
- Visual Resources
- Wilderness
- Agriculture
- Native American Concerns
- Transportation
- Visibility
- Soils
- Vegetation
- Paleontology
- Recreation
- Land Use
- Forests
- Archaeology
- Socioeconomic Concerns

Examples of Social Impact Assessment Categories

- * Health and Safety
- * Variety and Diversity of Choice
- * Equality of Opportunity and Benefits
- * Population Mobility, Density, Displacement
- * Human Service Availability
- * Aesthetic Value
- * Community Cohesion
- * Leisure Opportunity
- * Historical Continuity
- * Psychological Security
- * Neighborhood Stability
- * Educational Opportunity
- * Public Services
- * Racial Concentration/Diversity
- * Cultural Identity

Comparison Studies for Impact Assessments

- Different Levels of Development for the Same Location
- Same Level of Development for Different Locations
- Different Technologies Of Treatments for the Same Location

Purposes of Impact Assessments

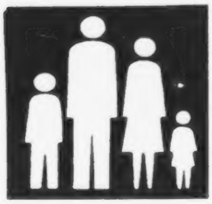
* Understand Complex Effects of Impacts

* Prevent Adverse Affects

* Protect the Public's Interest

* Identify Alternative Approaches

* Involve Affected Constituencies



Procedures for Impact Assessments

1. Define the Assessment Task
2. Describe Relevant Technologies
3. Develop State-Society Assumptions
4. Identify Impacted Areas
5. Make Preliminary Impact Analysis
6. Identify Possible Action Options
7. Complete Impact Analysis for Each Option

Decision Dilemmas of Impact Assessments

- Short-Term Benefit vs. Long-Term Costs
- Benefits vs. Tolerable Risks and Costs
- Economic Growth vs. Environmental Protection
- Individual-Controlled Technology vs. Corporate-Controlled Technology
- Benefits To Some vs. Burdens to Others
- Benefits To Present Generations vs. Benefits To Future Generations

Public Participation Activities for Impact Assessments

1. Gather Data from Affected Parties
2. Include Interested Parties on Advisory Committees
3. Encourage Dialogue Regarding Alternative Plans
4. Conduct Citizen-Controlled Impact Studies

Roles for Cooperative Extension Professionals

- * Watch for Conditions That Require Assessments
- * Act as Brokers Between Citizens and Technologists
- * Disseminate Findings from Impact Assessments
- * Facilitate Dialogue Among Interested Parties About Alternatives

Definition of Invention and Creation Techniques

Futures-Oriented techniques that begin with the capacity of individuals, groups, and organizations to invent and create impelling goals and images of preferred conditions as the basis for influencing the future, through choice.

Techniques for Futures Invention and Creation

* Preference Surveys

* Values Audits

* Images and Imaging

* Scenario Building

* Futures History Writing

* Action Planning

Procedures for Conducting Preference Surveys

1. Identify the Focus and Select Samples
2. Survey Sample Groups
3. Analyze Data and Compare Different Perspectives
4. Identify Common Preferences
5. Use Findings to Generate Dialogue Among Groups
6. Generate Action Plans Consistent with Common Preferences

Procedures for an Organization Values Audit

1. Form a Values Audit Steering Committee

2. Conduct a Values Inventory with an External Consultant

3. Conduct a Values Analysis: Distribute a Report

4. Encourage Dialogue Throughout the Organization

5. Write Papers on Selected Values

6. Encourage a New Values Consensus

7. Institutionalize New Organizational Procedures

Procedures for Imaging

1. Identify Participants
2. Identify Specific Concerns about the Future
3. Clarify Participants' Specific Concerns
4. Demonstrate Imaging from Personal Memory
5. Generate Concrete Images in General Categories
6. Share Images in Small Groups
7. Initiate Focused Imagery
8. Receive Feedback in Small Groups
9. Search Focused Images for Central Themes
10. Engage in Story Telling in Large Group
11. Form Collaborative Imaging Teams

The Grammar of Imaging

Rule 1. Be Concrete and Specific.

Rule 2. Do Not Interpret Your Image.

Rule 3. Yield to Your Images; Let Them Flow.

Rule 4. Shift One or More Variables or Factors in Your Image and Discover What Happens.

Rule 5. Withhold Plausibility and Preference Judgments About Your Images. Do Not Censor.

Rule 6. Return to Your Image When in Doubt.

Rule 7. Feel the Image. Internalize It.

Rule 8. Never Force the Image.

Rule 9. Always Be Prepared for New Images.

Rule 10. Move Into the Time and Place of the Image and Live It.

-Ziegler (1984)

Definition of a Scenario

A Detailed Description of the
Future Nature and Scope
of
Unfolding Potential Events,
Objects, and Processes

Procedures For Scenario Building

1. Set Forth a Clear Statement of the Goal
2. Imagine Indicators for Evaluating Achievement
3. Specify Assumptions, Values, Rationale
4. Describe Persons or Groups Affected
5. Identify Planning Decisions
6. Select Several Scenario Logics
7. Elaborate Alternative Scenarios
8. Describe Means, Methods, and Strategies
9. Identify the Decision Implications of Each Scenario.

Procedures for Futures History Writing

1. Place Oneself in the Future and Imagine That the Intended Future Has Happened. Then Ask, “How Did It Happen?”

2. Compile, Through Imaginary Memory, a List of Specific Concrete Events

3. Record the Events into a Plausible Historical Record According to Time Periods

4. Review the Future History Document for Discontinuities and Gaps

5. Return to Imaging to Create New Material, as Necessary

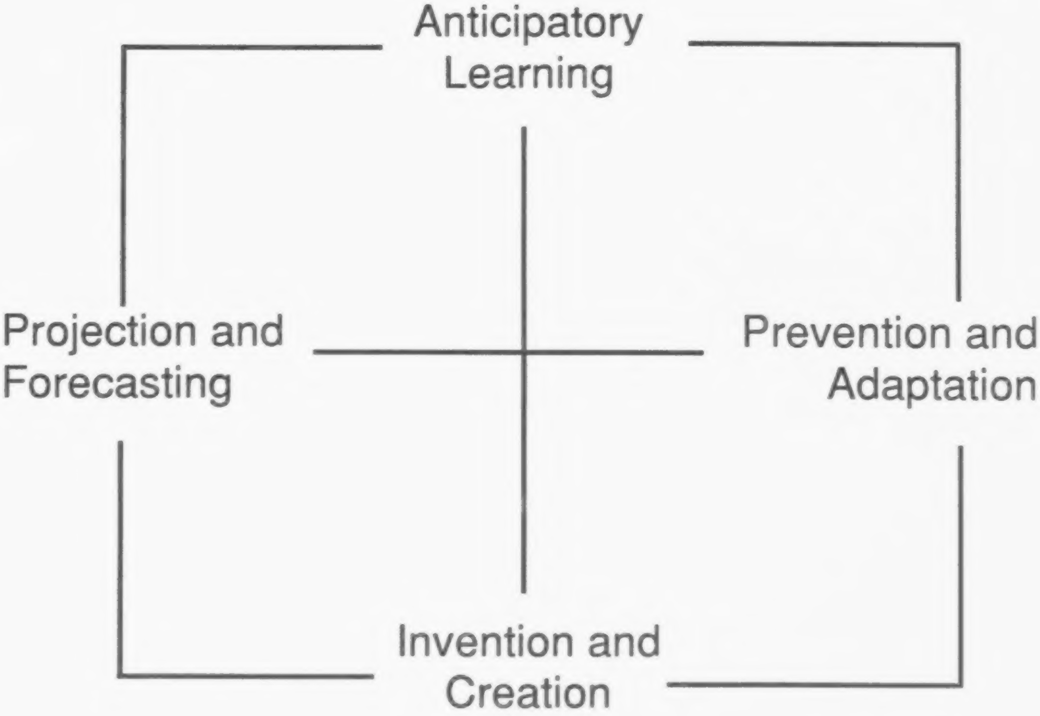
6. Share Documents with Other Participants and Receive Feedback

7. Collaborate on Creating Futures History Documents Around Common Scenarios

Procedures For Action Planning

1. Set Short-Term Objectives
2. Identify Action Groups
3. Analyze Enhancers and Inhibitors
4. Identify Resources
5. Design Instruments and Action

Relationship Among Approaches for Futures Perspectives



Anticipatory Learning

Projection and Forecasting

Prevention and Adaptation

Invention and Creation

What To Consider When Selecting Techniques

Purpose

Problem Characterization

Nature and Extent of Available Information

Scope of the Situation

Urgency of the Situation

Time Frame

Level of Participation